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ABSTRACT

The development of strong reading competencies in educationally at-risk preschoolers in the Early Childhood Day Care Center (University of Alabama) was established through intensive training with a synthetic phonics approach. Subjects' reading performance was assessed on the basis of criterion-referenced tests and standardized reading tests, including the Wide Range Achievement Test and the first-grade Metropolitan Achievement Test (MAT). Noteworthy were findings for differences in length of program participation: children entering first grade who had 2 years of preschool training scored at the second-grade level on most MAT subtests and were firm on a range of decoding and inferential-based comprehension skills, whereas those with 1 program year did best on decoding and literal-comprehension items. Evaluation of reading competencies of children from other preschool programs not providing reading instruction showed word recognition and comprehension performance to be low or nonexistent; letter recognition and letter naming, however, were at average levels. (This document describes the synthetic phonics approach in detail.) (Author/RH)

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Accelerating Reading and Comprehension in Poverty-Level Preschoolers Using a Synthetic Phonics Program[1]

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Abstract

The development of strong reading competencies in educationally at-risk preschoolers was established through intensive training with a synthetic phonics approach. A description of this approach is provided, as are findings of reading performance from criterion-referenced tests and standardized reading tests, including the WRAT and the first grade MAT. Noteworthy were findings for differences in length of program participation: first grade-entering children with two years of preschool training scored at the second grade level on most MAT subtests and were firm on a range of decoding and inferential-based comprehension skills; whereas, those with one program year did best on decoding and literal-comprehension items. Evaluation of reading competencies of children from other preschool programs not providing reading instruction showed word recognition and comprehension performance to be low or nonexistent; letter recognition and letter naming, however, were at average levels.

Ever since it opened its doors to poverty-level preschoolers in 1970, a major and continued objective of the Early Childhood Day Care Center (ECDCC) has been to identify and accelerate the academic achievements of its beginning three to four year-old participants. Along with language development, the heart of its academic curriculum is the teaching of reading. For the ECDCC staff, it was never a matter of whether to teach reading to preschoolers. We all agreed it was important to do so, despite critics arguing that four to five year-olders were too young or that it would somehow stifle their creativity (Moore & Moore, 1979; Robinson, 1973). Rather, at issue for us was: teach according to what method, for how long, and up to what level of reading proficiency? Everyone was aware of the disastrous public school track record of low income minorities in reading and other academic tool subjects. With achievement test scores lagging further behind with each school year (U.S. Office of Education, 1976; Westinghouse Report, 1969), the children were set apart from their more educationally advantaged peers which led them to adopt negative attitudes toward school, and, in many cases, to drop out. To offset some of these problems, we hoped to make educationally at-risk children literate before they ever set foot into the public school door.

The teaching of reading or any content area to children in the preschool has its advantages. On a practical level, the child-teacher ratio in the preschool is at least half of that found in the frequently overcrowded classroom of the public school. In

many cases, a preschooler is with the same teacher for a two-year period (from 4 to 6 years of age) compared to the public school practice of spending each successive grade with a different teacher. Should teacher continuity not be possible (or desired) in the preschool, this need not become a problem as long as continuity in skill development is guaranteed by using a multi-level instructional program in which the sequence of skills is hierarchically arranged. Different preschool teachers can share or take turns in the responsiblity of what skill level to teach. If there are separate programs for each of the content areas of language, reading and arithmetic, and all children receive instruction in every area, the teachers, by specializing, can get to interact with every child at least once per day.

Another advantage of starting reading in preschool is that it is probably an easier and more gratifying task to get a preschooler on the road to literacy than to try to undo the poor and careless reading habits of an often recalcitrant, older grade-school child. With the commercial program we now use, known as Distar, the beginning reader quickly learns to engage in many overt acts -- to read orally, to keep track of each word with his finger, to decipher a word by "looping" under each critical sound as the word is sounded out, and to slash under the word as it is said at its normal rate. The main reasons for "overtizing" the operations in early reading, as with any series of behaviors typically done at the covert level by sophisticated students (Paine, Carnine, White, & Walters, 1982), is to enable the teacher to detect errors, provide immediate corrective feedback, and give assurance to

the naive learner that when these overt operations are done correctly, successful reading will result. With increased training and mastery, these overt operations are gradually placed under the control of the learner and made covert. The young reader is taught to read faster, silently, and to "take in" larger units of the word rather than the individual sounds.

Beginning preschool readers do not mind doing the overt acts just mentioned, especially if the teacher models each act and frequently reinforces their occurrence. On the other hand, a failing second or third grader, given remedial reading training and asked to perform many of these acts might find them "babyish" and try to resist the teacher's justifiable efforts to establish them. When asked to read orally, the problem reader often tries to 'whiz' through the passage even if it results in countless errors of accuracy and interpretation. If asked to slow down, by touching each word, he is insulted and becomes uncooperative. When asked to identify sounds in isolation or in a word, the problem reader is at a loss. Having been able to get by in the early grades by memorizing sight words, using context and picture cues, and getting encouragement for guessing, all of which detract from attending to the details of the printed word, the problem reader is neither willing or able to modify these long-established habits. Needless to say, none of these counterproductive behaviors and negative attitudes about reading are likely to develop in the inexperienced preschooler who, from the start, is taught consistent strategies for decoding words.

If entering first graders who would otherwise be classified

as educationally at-risk demonstrate impressive decoding and comprehension skills, then elementary school teachers will probably note these children and attempt to learn how they were taught in order to more successfully teach other at-risk children in their classes. It is important to stress that reading competencies of the new first grader must considerably exceed normal expectations before teachers and/or administrators will sit up and take notice. Instructional changes in the public school are slow, and our experience has shown that teachers of at-risk children are reluctant to consider new programs and teaching tactics unless they are given tangible evidence of outstanding achievements in other children.

For six years prior to the adoption of the Distar program at our facility, very few elementary school teachers or principals cared to spend time with us to observe our preschoolers learning. Although we successfully developed a number of reading and reading-related skills, such as alphabet-letter identification (Kincaid & Weisberg, 1978), a sight-word vocabulary of from 10-50 words in some children, and an interest in books, the teachers were not about to inquire in any detail about how we taught reading. To be sure, upon starting first grade our pre-Distar children were somewhat ahead of their poverty-level peers by having these skills, but by the end of first grade both groups were generally equal in how far behind they were in reading achievement.

All this changed after the senior author and his wife spent a one-semester sabbatical leave at the University of Oregon learning about the principles of direct instruction (DI) programming and getting experience using DI procedures. Upon returning to

Tuscaloosa in 1976, they set up a DI Reading program at the ECDCC and at one public school where the children had always been about one standard deviation unit below grade level in reading. As the reading achievement at both schools improved, so did the number of observers who came to watch Distar Reading. One- and two-week workshops were given each summer at the ECDCC, with the teachers getting practice teaching the preschoolers and the preschoolers, many times, teaching the teachers and making them look good. So far, over 150 teachers have gone through these intensive workshops. Distar Reading is now used in almost every city school, mostly with hard-to-teach children, and its successful accomplishment in reading has paved the way for the use of Distar Language and Arithmetic, as well as the companion programs of Corrective Reading, Mastery Spelling, and Math Modules.

Having multi-levels of an ordered sequence of reading programs available in the public school should theoretically enable children who have already learned the lower order skills to be placed directly into classes beginning at the next appropriate skill level. The issue of what happens to our children when they enter public school will not be discussed here, although it is one that we are currently pursuing (Weisberg, 1982) and we plan to give attention to it in some future account. Suffice it to say, without some guarantee of program continuity in the kinds of skills taught and a commitment to continued intensive academic training at all school levels from preschool onward (Becker, 1977; Becker, 1981), it would be unrealistic to think that by some "magic" our preschool successes would forever be maintained.

Background

Supporting Agencies

Since its inception in 1970, the ECDCC has provided year-round, full-time day care services for poverty-level preschoolers living within a ten-mile area of its location on the University of Alabama campus in Tuscaloosa. These services have been funded under yearly contractual and sometimes vendor-service arrangements with the Alabama Department of Pensions and Security (DPS), the state public welfare agency authorized to apply for federal monies under Title IVA of the Social Security Act (later Title XX). Partial support has been intermittently provided by the Psychology Department, which administers and sponsors the ECDCC, and by the Office of Contracts and Grants. In addition, the U.S. Department of Agriculture, through administrative liaison with the Alabama Department of Education, has enabled the ECDCC to receive yearly funds under the Child Nutrition Program.

Other agencies or groups which, at one time or another, have provided financial assistance or made in-kind contributions, are the Southern Education Foundation of Atlanta, the Parent-Child Development Center of Birmingham, the Psychology Department's Psychological Clinic, and Psi Chi, the Psychology Honorary Society.

Children Served

All eligibility and monitoring requirements for the ECDCC are set by the Alabama DPS and its local counterpart, the Tuscaloosa DPS. Throughout the years, eligibility has been mainly focused on below poverty-level family incomes, special family circumstances such as physical and/or mental handicaps of the household head,

and state-appointed custody of the child because of abuse, neglect, or abandonment. The ECDCC is licensed to serve 24 three to six year-old children and must accept all children referred by the Tuscaloosa DPS. As it turns out, the parents also qualify for full coverage of the Child Nutrition Program, which as of 1983 entitles the children to a free breakfast, lunch, and afternoon snack. In almost all cases, the monthly incomes of the ECDCC's children's families were much less than the free-meal income standards.

Single-parent and extended family patterns predominated. Over 80% of the children were Black and 60% were male. The average family included about five members who lived in over-crowded dwellings containing nearly 1 3/4 the number of individuals as found in the typical U.S. household. The average educational level of the child's legal guardian was 10.3 years (high school completion is 12 years) and, if that person were employed, it was nearly always in unskilled work. These family demographics resemble those of low SES groups and are characteristic of families whose children have participated in previous preschool intervention studies (Miller & Dyer, 1975; Schweinhart & Weikart, 1980).

Upon entry to the ECDCC, most children are four years old. About 80% remain at least one program year and, for most years, 40% to 50% of these continue a second year (their kindergarten year). This usually amounts to between eight and ten children graduating annually into first grade after two program years. In the recent past, the number of two-year enrollees has been fewer than we would like due to an emerging DPS policy of placing eligible five year-olders from our program into public school kindergarten. The rationale

behind this action is to shift payment by one state agency to another, i.e., from the Alabama DPS which authorizes day care payments, to the Alabama Department of Education which finances Title I public school kindergarten. The reduced number of two-year graduates in 1981 and 1983, 4 children and 5 children respectively, reflects this policy.

When they begin, the preschoolers are unable to read or to write words, spell, or do any mathematical computations. The Slosson IQ test (Slosson, 1981), the scores for which are taken as a sign of verbal competency, is given following a 2-to-3-week adaptation period to our facility. The mean entry IQ over the past three years (N=43) has been 85.6, with only 18.6% of the IQs exceeding 100.

Curriculum Considerations

The Distar Programs

Distar programs in language, reading, and arithmetic are available. As developmental programs, each content area contains three interlocking levels (I, II, and III) with 160 lessons per level (exceptions are Arithmetic III which has 140 lessons and the new Reading Mastery programs with Mastery III becoming a functional replacement for Reading III). By teaching one lesson per day, an entire level can be completed in less than nine months. When used in the primary grades, the three levels are respectively taught in the first, second, and third grade, although the Level I programs can begin in kindergarten.

Program Usage at the ECDCC

During the first program year from 1976-1977, teaching priority went to the five year-olders who were taught the Language I and Reading I programs. From 1977-1978, the Arithmetic I program was added to the curriculum of the five year-olders and the Language I and Reading I programs were started with the beginning four year-olders. By 1979-1980 and thereafter, all three programs were taught to beginning four and five year-old groups. Children staying for one year typically finished all of Language I and Reading I and about three-fourths of Arithmetic I. Those staying another year usually completed all Level II components of Language and Reading and at least half of Arithmetic II.

Related Preschool Research with Distar

Based upon data from several DI Follow Through sites encompassing large N's (Becker & Engelmann, 1978), there was a substantial advantage to starting the level I programs at kindergarten rather than at first grade age: the third grade achievement scores of disadvantaged children were nearly always higher for K-starting sites, on the order of one-half standard deviation unit, and a greater proportion of K-starting children ended up with third grade achievement at the 50th percentile or higher. These data suggest that four program years (K to 3rd grade) are better than three program years (1st to 3rd grade), and justify our implementation of the Distar program in day care programs with beginning five year-olders as well as arguing for the continuation of its use in the public schools.

In an unsuccessful attempt to determine the advantage of five program years, Distar Reading I programs were launched with beginning four year-olders at one Head Start site (Becker & Engelmann, 1978). However, a pre-K to 3rd grade evaluation did not materialize owing to a lack of appropriate implementation of the program. In Tuscaloosa, there is some likelihood of assessing the impact of five program years inasmuch as our four year-olders (pre-K) have already begun Distar Reading at the ECDCC and some of them are being allowed to continue with this program in their first three public school grades. That evaluation will, hopefully, be completed within the next few years. For more immediate purposes, we will explicate in the section on Norm Referenced Evaluation the substantial academic benefits of teaching Distar for two preschool years (pre-K to pre-1st grade) over a single preschool year (K-starting to pre-1st grade).

Group Placement and Scheduling

Generally speaking, entering five year-olders are simultaneously placed in all three Distar programs, whereas the program placement for entering four year-olders is distributed over time as follows: after about one-quarter completion (40 lessons) of Language I, the Reading I program is added, whereupon after approximately 20 reading lessons, Arithmetic I is introduced to complete the academic curriculum. Once finished with a particular program, the level II component for that program is immediately begun.

Three to four classroom groups are formed with original assignment to the group largely dependent upon Language I placement outcomes (Engelmann & Osborn, 1976). Grouping is thus based upon

commonality in language skill attainments. Based upon their progress, children can be regrouped into either slower- or faster-moving groups. For scheduling and other practical purposes, the children gathered for instruction in academic programs usually remain together in that program for the entire year.

Group size is dependent upon teacher training and experience in direct instruction as well as the overall academic proficiency of the group. For best results, the size of the lowest performing group should be about two-thirds that of the highest performing group. Experience has shown that a well-trained teacher can work with up to eight or nine higher performing preschoolers while a less experienced one should begin with five or six.

The duration of the initial classes are brief, taking about 15 minutes. The introductory lessons contain simple tasks which the children can execute easily and which require from them light, verbal demands. The teacher models many of the relevant behaviors in an animated, enthusiastic manner and provides lots of verbal and physical encouragement. Written into the teacher presentation procedures are friendly teacher-child contests, "fooler" tasks, and quickly paced teacher-directed tasks that are likely to maintain attention (Carnine, 1976). At the ECDCC, the teachers are free to present unique rewards, such as special handshakes, stickers, rubber stamps, a sniff of cologne or perfume, "change-up" in a lesson, and so forth; the ultimate goal, however, is to make the rewards for learning more academic in nature. A description of the scope of rewards, organized according to those most useful for initial learning to those more academically based, is available (Weisberg, 1978).

As the children become more proficient and are able to apply the skills taught to a wider set of related tasks (about halfway through the program), class time gradually begins to increase to between 45 and 60 minutes. When this occurs, about three hours of the children's eight hour day are devoted to formal classroom activities, with another 10 to 30 minutes to extra-classroom activities such as reading library books independently, writing computational math problems or words on playroom chalkboards, and engaging in large-group, pre-breakfast instruction designed to review concepts and skill routines. An overview of the ECDCC daily schedule appears in Table 1.

Insert Table 1 about here

Small Group Instruction

The details of the structure, organization, and actual class operation of small group Distar classes are described elsewhere (Bateman & Carnine, 1977; Carnine & Silbert, 1979; Carnine, Witcher & Haddox, 1975). Briefly, four to seven children are seated close together in a tight semi-circle near the teacher so she can monitor everyone's performance and give encouraging pats and handshakes. A distinct characteristic of DI is the constant monitoring of the lowest performing children; those who make many errors, are not consistent in their answers, talk inaudibly and tend to wait until others have answered. They should be located directly in front of the teacher who must look at their mouths when they respond. Children responding in clearer audible voices and making fewer errors are seated near the ends of the semi-circle.

Table 1

Overview of Daily Schedule at
The Early Childhood Day Care Center (ECDCC)

Time	Description of Events
8:00 to 8:20	Children arrive and are assigned to small group and independent activities, many of which are the same as during the 9:00 to 9:15 period.
8:20 to 8:40	Pre-breakfast Group Instruction - one or more of the following are presented: Simon Says; Teacher reads from Language Storybook; review and practice of special formats in language (e.g., classification skills, common information), reading (e.g., sound identification, blending), or arithmetic (e.g., counting from a number)
8:40 to 9:00	Breakfast and toileting
9:00 to 9:15	Small group play: construction activities (train-set, block building, lincoln logs, tinker toys), writing/drawing on the chalkboard, kitchen play, puzzles, pegboards, individualized reading.
9:15 to 10:15	Distar Reading taught to 3 to 4 independent groups - - size varies from 5 to 7 children
10:15 to 11:00	Indoor and/or outdoor play: music and singing, movies, dress-up, story reading, monkey bars, tricycles, swings, slide, dodgeball, brief walk
11:00 to noon	Distar Language taught to 3 to 4 independent groups - - size varies from 5 to 7 children
Noon to 12:30	Lunch and toileting
12:30 to 2:30	Nap, toileting, and snack
2:30 to 3:30	Distar Arithmetic taught to 3 to 4 independent groups -- size varies from 5 to 7 children
3:30 to 4:00	Assigned activities and parent pick-up

Academic engaged time is high during a Distar lesson: the teacher secures attention from the group, presents the task, allows sufficient time for the formation of an answer, signals the group to answer orally and in unison, checks the children's answers and makes sure they are firm, provides corrective feedback if necessary, and immediately gets into the next task. The pacing is crisp and rapid, though this does not mean that the teacher speeds ahead at all costs. New and troublesome routines usually take longer to present and, when problem-solving strategies must be applied, the children are given the extra time to think. Children with oral communication difficulties are also given the time to practice more distinct and complete statements.

An overall rapid pace is possible because each task is brief, containing minimally worded statements specific to key concepts and the children repeatedly use these concepts in their answers. The amount of student participation and the opportunity to engage in much needed practice in oral language and reading responses is staggering. Assuming a teacher questioning rate of ten questions per minute, every child in the group will participate 300 times in thirty minutes! In many classroom situations where questions are asked in a round-robin fashion, with the higher performers doing most of the answering, the opportunity to respond is undoubtedly much lower. To examine the influence of pacing rate, Carnine (1976) observed two of the lowest performers of a small group of low achieving first graders in Reading I. With a slow pacing rate of four questions per minute, overall off-task behaviors averaged about 70% and the two children answered only 30% of the

time. In contrast, with a higher rate of 12 questions per minute, off-task behavior was only 10% and they answered correctly 80% of the time.

An unresearched aspect of small group responding is its potential for special children. Shy and withdrawn children may be less inhibited when responding in unison than during individualized instruction. The modeling literature has demonstrated the value of using a single complying peer to model appropriate behaviors to "impulsive" and other hard-to-manage children. In small group instruction, there is not one, but many appropriate child models. Weisberg and Clements (1977) presented evidence to show that the level of imitative behavior by the lowest performing children in a group could be raised and maintained much better if intermittent social reinforcement were given to the other members of the group than if given continually and exclusively to the lowest performing child.

As an alternative to small group instruction in the preschool, one-to-one tutorial teaching sessions spread throughout the day have been suggested. Although these may help the single child, there are problems related to cost-effectiveness and the scheduling of personnel. There is also the problem of acclimating the individually tutored preschooler to the vicissitudes of larger group, public school instruction. Koegel and Rincover (1974) found that hard-to-teach children, successfully taught simple academic and social skills in lengthy, one-to-one sessions, could not later perform these behaviors consistently in either a classroom-sized group or even in a two-member group. There need to be direct

comparisons between group and individualized instruction in terms of rate of progress and outcome achievement measures. In this regard, Favell, Favell and McGimsey (1978) reported that small group instruction, relative to individualized training, more efficiently used the teacher's time without resulting in any differences in learning acquisition between the two conditions.

Signals

As distinct cues which inform the student when to respond, predictable and easy-to-follow signals are useful for enabling all group members to respond simultaneously so that no child copies the answers of others. Thus, every child has a better chance to learn what is being presented by the teacher. When signals are not used, it could make the group members uncertain about when to answer, leading perhaps to off-target behaviors and group management problems. Uncertainty may also cause some high performing children to "jump the gun" and their dominance during the teaching session will discourage others from answering and deny them needed practice (Carnine & Silbert, 1979).

Signals are particularly important when guiding or prompting the learner through a series of responses in sequence. For example, in the early reading lessons the teacher segments a word by slowly saying the sounds in the word without pausing while simultaneously clapping as each new sound is said. At this point, everything is done orally and clapping in sequence demonstrates that a word is made of different sound units. It is also helpful in teaching the very valuable skill of oral blending, and is later

used to control the rate at which children decode printed words. Upon hearing the teacher's initial clap, the children are taught to touch under the first sound in a word and to say it. The next clap prompts them to make a quick (and previously teacher-modeled) looping movement to the next sound and to say that one, and so on, until the entire word is sounded out without stopping between the sounds. Having been previously taught the functional aspects of the teacher's claps during oral responding, including the skills of listening and waiting for each one to occur, the children thus concentrate entirely on looking at and saying the sounds in a printed word.

Teaching with Scripts

There are hundreds and hundreds of concepts and operations that at-risk preschoolers must learn if their chances of academic success are to be improved and sustained. Finding the most logical and efficacious manner of teaching concepts is a sorely neglected area of preschool education largely because of a failure to understand that the objects used to convey what the target concept is contain many identifiable features aside from the relevant one the teacher is trying to communicate to the learner. If the child is to learn, the teacher must at least select and sequence concept examples which are consistent with one and only one interpretation Engelmann & Carnine, 1983). If an illogical or inconsistent programming presentation series is used, there is the strong possibility that the learner, by acting very logically, will stubbornly concentrate on some irrelevant concept attribute or will behave inconsistently in a trial and error fashion (Weisberg,

Packer, & Weisberg, 1981). By the same token, to provide the learner with the steps to take in multi-step operations, like the strategies for decoding words, working algebraic subtraction problems or solving picture analogies, the teacher must attempt to teach the subskills in a logically consistent and coherent manner.

The point is that good instruction involves attention to many details. The teacher must control which instructional details to select, how they are to be sequenced and how they are integrated with other details. Since many teachers do not have either the time, the inclination, or the programming skills to develop a coordinated and complete instructional program, they must turn to other sources. One source consists of the scripted presentations that are part of every Distar program. These standardized scripts describe precisely what the teacher is to say and do and how to correct errors. Detailed information about key formats which specify critical teacher and child behaviors as well as common errors are elaborated in Teacher's Guides. Rehearsing for each day's lesson is facilitated since the scripts contain key instructional terms which are repeated in different formats and across different curriculum areas. Concepts that belong to the same class are taught the same way by using a common format structure, e.g., Sound, Number, or Object Identification formats are all taught essentially the same way because they deal with multiple stimulus attributes, whereas prepositions and descriptive adjectives are taught by an another common format structure.

Early formats start out with simple wording and a few easy-to-memorize steps. With skill development, the format's verbal load

for the teacher and child is gradually expanded as extra steps are added to the point where higher level concepts and operations can be taught. Later formats are usually shorter in length because of fewer explicit teacher/student behaviors. However, should an error in a multi-step task occur, the teacher corrects by re-introducing the relevant teacher talk from those earlier, more elaborated formats and by prompting the student to use the appropriate strategy for re-doing the task.

Scripted presentations provide the kind of quality control necessary in education to ensure consistent implementation of a program. By following the teacher talk, the teachers can find out if the wording in the script is actually related to any improvement in student performance. Standardized teaching routines also permit clearer communication among teachers, trainers, and supervisors about what was taught and in what sequence. In-service workshops can be conducted with great savings of time and economy if discussion is centered on a common format that everyone has taught. In elementary school settings, the supervisor familiar with a standardized script can immediately pinpoint what is going on in a classroom which employs that scripted material. Explicit and relevant assistance is thus facilitated.

Standardized scripts, in of themselves, don't necessarily ensure the development of intelligent and complex pupil behavior. However, they do provide a baseline against which such a supposition can be tested, leading perhaps to a functional analysis of that instructional presentation most relevant for student progress. If teachers faithfully present the tasks called for by scripted formats and

pupil failure occurs, then blame must be directly assigned to the details in the scripted content. In contrast, by keeping to a non-explicit, non-verifiable sequential account of what was taught and how, the teacher and the program are exonerated from major responsibility when low performing children fail to learn. When failure occurs, blame is conveniently assigned to teacher-invented entities residing within the learner or to extra-classroom factors beyond the teacher's control.

Recruitment and Teacher Training

Preference is given to individuals who have attempted to teach in academic settings and/or have experience in managing children in large group settings. (See Bereiter & Engelmann, 1966; Witcher, Skillman & Becker, 1977, for the characteristics of individuals likely to work well as DI teachers.) Whenever possible, new teachers participate in a one-semester, college level Distar Language course taught by the senior author. The students learn DI principles and get daily supervised experience teaching Distar Language to the ECDCC pre-schoolers. Training in Distar Reading is derived from watching others teach and from supervised instruction from more experienced reading teachers and from the senior author.

The educational background of past Distar teachers has varied from having only a high school education to two years of graduate experience. Of the 13 teachers associated with the ECDCC during the past eight years, only one has had a teaching certificate.

The Reading Period

Structure of the Reading Lesson

Taught in the first part of the lesson are those concepts and

skills necessary for mastering the reading activities in future lessons. The teacher presents tasks from a Teacher Presentation Book, which is a spiral containing scripted formats. For example, before the children encounter a word in a story, it is previously read in isolation from the spiral. When they have the skills for sentence and story reading, this activity becomes the second major component of the lesson. Starting at lesson 40 in Reading I, a three-word sentence is read and from lesson 96 until the end of Reading I and throughout Reading II, the children read from storybooks under the direction of the teacher. The Reading I stories provide practice in decoding words and afford an opportunity to improve reading speed, inflection, and basic comprehension skills. The Reading II stories are more complex and allow improvements in speed, vocabulary, and understanding of what is read. (Sample storybook material will be shown later.)

The final component is devoted largely to written work. Daily worksheets which the children get to keep, known as "Take-Homes," provide practice in doing independent written work. Aside from giving practice in writing the letter sounds and answering reading and picture comprehension items, the Reading I Take-Homes provide the first opportunity for teaching many activities, such as learning directionality skills, finding words and periods in stories, and committing sentences to memory (e.g., statement-repetition skills). The Reading II Take-Homes provide practice in writing, reading silently, remembering information presented earlier in the storybooks, answering comprehension items and engaging in different test-taking skills. An overall benefit of the Take-Home is learning how

to do independent seat work for longer and longer intervals. The Reading II Take-Homes provide the means for teaching new tasks, such as learning to follow written instructions and doing deductive reasoning tasks. Examples of some of these tasks will appear later.

The Take-Homes serve as tangible rewards for good work and provide a possible link between home and school. They also act as a powerful mechanism for getting new children interested in going to class. Upon seeing the more advanced students leave class with Take-Homes in hand and getting accolades from adults for good work, the Take-Homes become a prestige item and a drawing card for others to attend class.

Starting at lesson 50, spelling is taught. First, individual sounds, then words and sentences are written in response to the teacher's dictation. The spelling of words is tied to the sequence of words taught in other parts of the program. Spelling lessons are typically given every other day.

It normally takes from 30 to 40 minutes to complete the first two teacher-directed activities and another 20 to 30 minutes for the Take-Homes, including time for the teacher to inspect them and to give help with difficulties. Midway through Reading II the children are spending from ½ to 2/3 of their time in independent seatwork activities.

Extra Classroom Reading

When not in class or while waiting for others to finish classwork, the children are free to read from the Distar Library Series (Engelmann & Bruner, 1977), a collection of books correlated with the lessons in the Reading I program. Basal readers are also used as supplementary reading material for children in Reading II, not to mention the dozens of library books available.

On special days, individual children in Reading II are given the opportunity to read stories to a group of Reading I children. Material taken from the Reading II storybooks and from well known classics, e.g., The Ugly Duckling, and from commercial products, e.g., Spiderman, are useful here. Parents report that their children frequently read before relatives and friends, with selections stemming from the Take-Homes, newspapers and the Bible.

Reading is also useful for understanding posted signs around the ECDCC, e.g., "lift seat before you pee" or "hold onto railing when walking up (down) stairs." The children further use their reading skills to figure out story problems presented in Distar Arithmetic programs and to learn language concepts presented in special formats designed by the ECDCC staff.

Decoding

In the early phases of Reading I instruction, the emphasis is on the correct decoding of regular-sounding words, i.e., words in which each letter produces its most common sound as found in the English language. For example, mat and jump are regular-sounding, whereas was and talk are not. The act of decoding or blending sounds to form words, if done properly, can become a generalizable strategy which will enable the learner to discriminate highly similar words, such as trunk and truck or can and cans.

Reading Preskills

A careful analysis of the process of decoding reveals four requisite preskills: sound identification, directionality, telescoping, and segmenting, the latter two of which are part of the blending process.

1. Sound identification. Important to note is that letter sounds are taught before the traditional alphabet-letter names. Letter names are introduced later in Reading II in the context of teaching spelling. As a logical first step in reading, it is more important to teach the correspondence between the written symbol and the most common sound it represents (Carnine & Silbert, 1979). Figure 1 shows two sound identification formats; the top one comes from an early Reading I lesson (21) and the bottom one from an early Reading II lesson (21).

Insert Figure 1 about here

Using a model-lead-test procedure to teach new sounds, the teacher models the sound, then says it with the children, and

(a)

SOUNDS Lesson 21 23-A

TASK 16 Child plays teacher

a. Use acetate and crayon.
b. (Child's name) is going to be the teacher.
c. He is going to touch the sounds. When he touches a sound, you say it. Keep on saying it as long as he touches it.
d. The child points to and touches the sounds as the group responds. You circle any sound that is not firm.
e. After the child has completed the page, present all the circled sounds to the children.

s

m

ē

a

(b)

LESSON 21

SOUNDS

TASK 1 Sounds firm-up

a. Point to the sounds.
Tell me these sounds.
b. Point to each sound. Get ready.
Touch the sound. *The children say the sound.*
c. Repeat problem sounds until the children can correctly identify all sounds in order.

Individual test
Call on several children to identify one or more sounds.

u m n

qu ing er

sh f p

r h J

Figure 1. Sample sound identification formats from: (a) Reading I, lesson 21; and (b) Reading II, lesson 21.

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finally, has them say it by themselves, either together as a group or individually. The order of sound introduction, shown in Figure 2, also differs from the traditional alphabet sequence.

Insert Figure 2 about here

Several programming principles were used to derive this sequence. First, high-utility, frequently occurring sounds, such as m, s, and a, are introduced before less useful sounds, such as j, x, and z. In addition, letter sounds which are similar in appearance (m/n; f/t; b/d) and/or in the sounds they make are introduced several lessons apart from each other to prevent visual and auditory discrimination problems. Also used to make the process of decoding easier are orthographic prompts, such as "macrons" or long lines above the letter to denote the long vowel, and the joining of two letters to indicate that this pair makes a single sound (or a "digraph," as in th, ch, and so forth). Additionally, the difference between similar letters is facilitated by exaggerating, but not distorting, important letter features, as in making the "ball" part of the d more oval-like or shortening the hump of the h. To show how the letter orthography is altered in the program, the three storybook passages in Figure 3 are presented as samples.

Insert Figure 3 about here

The top passage is from the end of Reading I, lesson 159, where the original orthography is maintained. The middle passage is from Reading II, lesson 122. Here, many of the macrons are eliminated, many joined letters such as th have become unjoined, and the

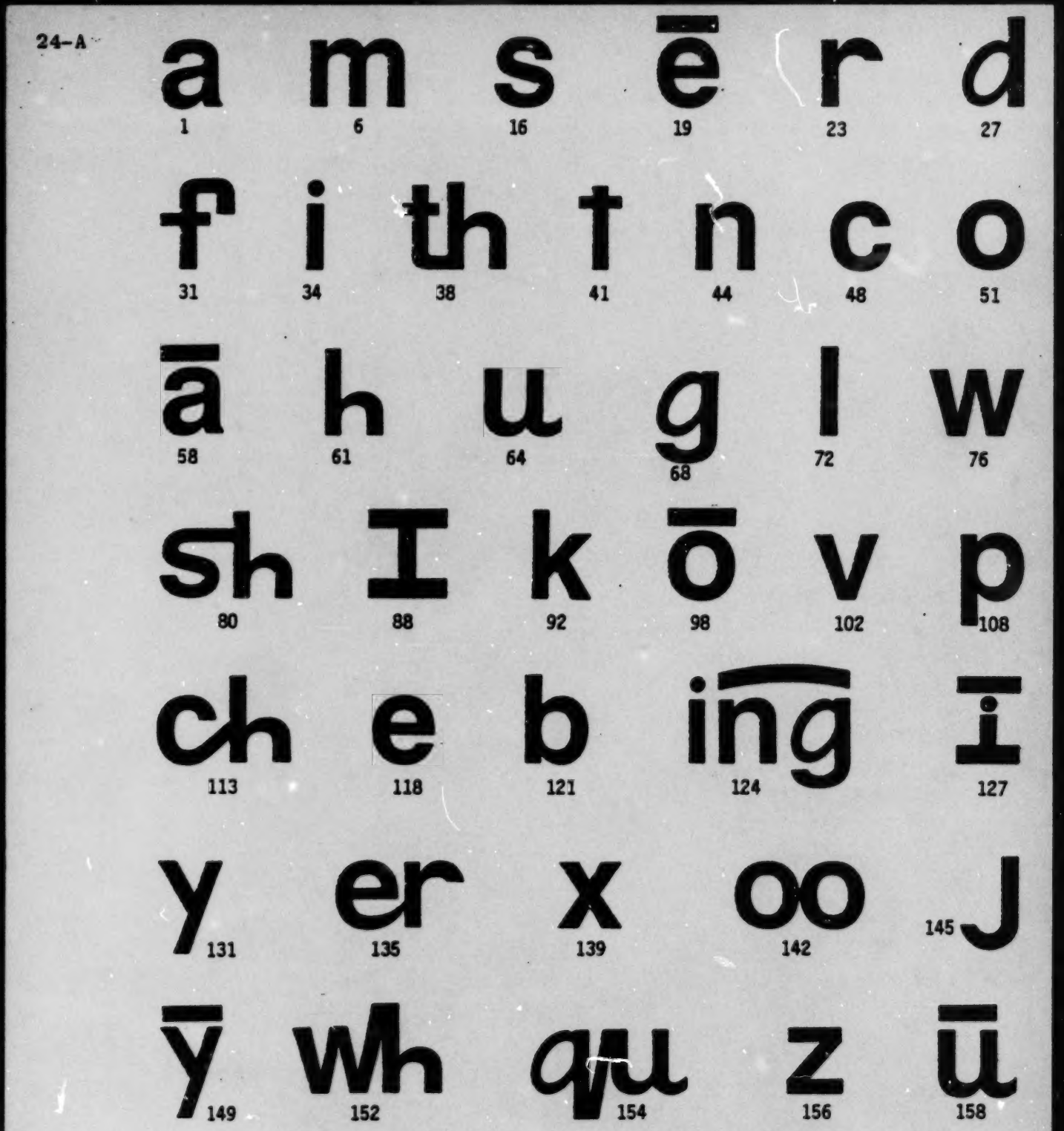

Figure 2. Letter orthography used in the Distar Reading I program to teach sounds. Numerals under the sounds indicate the lesson number (out of 160 lessons) where the sound is introduced.

(a)

a fat man lIked to gō fast

a fat man lIked to gō fast. hē went fast in his car. hē walked fast and hē ran fast. hē ēven talked fast. his wIfe did not lIke him to gō sō fast. but hē went fast.

(b)

Ellen Calls for Help

Ellen was reading a genie book. The book tōld about many tricks. One part tōld how to call for help. Ellen was reading that part now. She wanted to call for another genie who could help her fInd Ott.

(c)

She Tricks a Talking Animal

Jean had met a talking bug. She said to herself, "This is a talking animal. There is a rule about talking animals, but I can't remember it." Tell Jean the rule about talking animals.

Figure 3. Distar storybook selections showing the transition from altered to traditional orthography: (a) Reading I, lesson 159; (b) Reading II, lesson 122; (c) Reading II, lesson 158.

formerly smaller silent e is now full-sized. Finally, in the bottom passage from Reading II, lesson 158, the orthography has been completely "normalized."

It should be noted that, except for I, capital letters are not presented in Reading I. Relative to lower-case letters, capitals appear less frequently in written text and are thus less critical to learn. To begin teaching both types of letters would not only increase instructional time without bringing any major benefit, but might also evoke discrimination problems. For instance, to teach the rule that capitals are only bigger versions of their lower-case counterparts would not consistently follow from a comparison of the first seven alphabet letters, with only the C and possibly the F in support of this rule. When capitals appear in Reading II, starting at lesson 96, they are introduced as sounds and only later in lesson 112 are the letter names and the alphabetical order for both lower-case and capital letters taught.

2. Directionality. Reading symbols from left-to-right across the page is prompted by arrow-shaped underlines, depicted in Figure 4. The children are first taught to imitate a sequence

---

Insert Figure 4 about here

---

of actions starting from the start-ball of the arrow and continuing across the line. Actions are soon replaced by sequences of sounds in which the spacing gets closer as decoding training progresses.

Directional arrows are further used to guide the reader to "swing around" to the next row upon reading the last word on the row just above it. The period also becomes functional as a

(a)

(b)

a m

Lesson 26

(c)

mad

Lesson 54

Figure 4. Use of directional arrows to teach left-to-right sequencing with: (a) actions; (b) individual separated sounds; and (c) saying sounds continuously in a word. All tasks are from Reading I.

directional prompt by teaching the operation of how to back-track to find the beginning of a sentence. The children are taught to read by touching each word in succession so as not to lose their places and to alert the teacher to provide assistance if they do. Throughout training, the attempt is made to place increasing control of performing operations on the learner and, when external stimulus and response prompts are utilized, they should be removed as soon as possible.

3. Segmenting. Taught by a "saying the sounds" format, segmenting is a key skill for decoding new words. It is first taught as an auditory skill; for instance, the teacher claps for each sound and says, "say the sounds in the word man," and the learner responds, "mmmmaaaannnn."

4. Telescoping. Like segmenting, telescoping is initially taught as an auditory skill by "say it fast" formats. The teacher says, "I'll say the sounds in a word and you say it fast. Listen: mmmmaaaannnn. Say it fast! Right, man!"

Once auditory blending is strong, segmenting and telescoping operations are applied to printed words. The teacher models sounding-out a word by looping continuously from one sound to the next in a left-to-right order and says the word fast by slashing quickly under it. In due course, the children also learn to loop and slash as they decode printed text on their own.

Other Considerations

New words are first presented in isolation and corrections are made in this context so that when they later appear in a story the words will not be mystifying and cause the children to guess and rely

on pictures and context cues. Pictures do not appear as part of the story but rather come at the end, once the children have proven they can read the printed text. Pictures do serve to encourage verbal expression and are useful in comprehension tasks.

Once a student can accurately blend regular words, then phrase, sentence, and, finally, story passage reading is introduced. By this time, the children can read some whole words by sight, and fluency begins to develop. The same decoding strategy, workable with regular words, is applied to irregular words (such as, _is_, _was_, and _said_). Children are taught that these words are somewhat different from regular decoded words but nevertheless may be consistently sounded out and then pronounced as the words are commonly said

To help the children analyze parts of words, rhyming strategies are used throughout Reading I and II and, in Reading II, longer words including compound words and endings, such as in _another_ and _dropped_ are read in parts; the last part is covered (in this case, -_other_ and -_ed_) and the first part read, then the entire word is uncovered and the whole word read.

Comprehension

Carefully controlled, step-by-step instruction is directed toward the systematic development of the broad range of higher order reading responses typically known as comprehension behavior. The children are not merely exposed to comprehension tasks and asked questions in a random, "hit-or-miss" fashion which tap the already sophisticated learner's vocabulary and semantic skills and leave the struggling naive learner untaught. During story reading, factual questions are asked about different aspects of a sentence or story-line: questions about what, who, where, why, and how many; about what the story's character did or how s(he) felt, and if something was quoted the children are asked to recall part or all of it.

Differences Between Reading I and II

In Reading I, the sentences are straightforward and the story line is fairly simple. In Reading II, both the sentences and the stories get longer and more complex and the content emphasizes reading as a means to: obtain new information; follow instructions; provide direction in searching for details in pictures; and, finally, learn rules from which logical deductions can be made and applied to illustrations and to printed information.

Answering comprehension questions in Reading I is done by oral responding during story reading and, in the take-homes, by circling the correct answer from three choices, by filling a blank with that choice, by matching pictures with the appropriate word, or by completing the spelling of a word that describes a picture. These comprehension items are continued and elaborated upon in

Reading II. A favorite task is 'Read-the-item.' Here, after reading a single sentence, such as "When the teacher says go, touch your head," the teacher varies her actions to test whether the children will perform the action specified or will be "fooled" into doing otherwise. Comprehension items in Reading II also include copying and spelling key words and phrases based upon reading a paragraph on the take-home or a storybook selection read earlier that day or recalled from a previous one. In Reading II, the storybooks are increasingly linked to the take-homes, and the children are given practice in reading silently and working independently.

To get an idea of the kinds of comprehension tasks our preschoolers with two years of reading training are expected to do, the following samples of Reading II take-home exercises are shown. Performance on a reading comprehension task is provided in Figure 5.

Insert Figure 5 about here

Tasks that test how well children follow written instruction of various levels of difficulty are seen in Figure 6.

Insert Figure 6 about here

A series of comprehension tasks dealing with picture and written deductions are revealed in Figure 7.

Insert Figure 7 about here

TAKE-HOME 84 SIDE 2

one dāy the super bug met a sad hōrse flȳ. the hōrse flȳ said, "I am sad bēcause there are not any hōrses for me to bite. I am not a man flȳ. I am not a dog flȳ. I am not a house flȳ."

the super bug picked up the hōrse flȳ and took him to a hōrse farm. now the hōrse flȳ is happy. he can bite all the hōrses he wants.

1. who did the super bug mēēt? a hōrse flȳ

2. whȳ was the hōrse flȳ sad?
bēcause there were no hōrseS to bite

3. where did the super bug take the hōrse flȳ?
to the hōrse farm

4. is the hōrse flȳ happy on the farm? Yes

Figure 5. Sample comprehension task from Reading II Take-Home, lesson 84.

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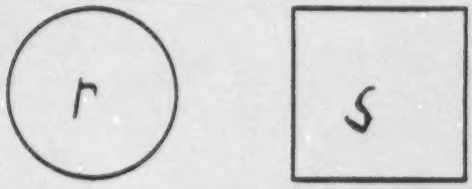
NAME joe

(a)

1. māke r in the circle.

2. māke s in the box.



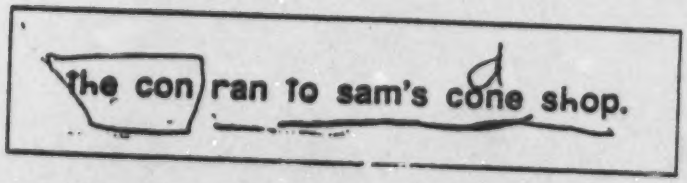
(b)

1. māke m in the circle.

2. māke a over the circle.

3. māke r under the circle.

(c)



1. make a d over the word cone.
2. make a box around the words that tell who ran to sam's cone shop.
3. make a line under the words that tell where the con ran.

Figure 6. Sample Reading II Take-Home tasks involving following instructions. Top (a) is from lesson 18, middle (b) is from lesson 26 and bottom (c) is from lesson 84.

29-C

(a) If it is fat and has 4 legs, it is a ronk.

Circle every ronk.

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TAKE-HOME 151 SIDE 2

(b) Every lion is sleepy. . Rod is a lion.

What do you know about him? He is sleepy.

(c) Find out who is a fireman.

Rule: Every fireman has short hair.

Tom has short hair.
Tim has short hair.
Ron has long hair.
Ellen has no hair.
Ott has short hair.

Who is a fireman? tom tim ott

Figure 7. Sample Reading II Take-Home tasks involving a: (a) picture deduction (lesson 145), and (b) and (c) written deduction (lessons 151 and 160, respectively).

Comprehension and Language Training

Comprehension questions may be improperly answered for many reasons, chief among which is that the question or appropriate story content presumes semantic relationships and information about the world that is beyond the level of the reader. Aware that a rich and diverse vocabulary can overwhelm the naive reader, the authors of Distar Reading have used a controlled vocabulary and have advised that, whenever possible, unfamiliar story content and vocabulary items be pretaught. Needless to say, pre-entering first graders who already understand much of the language concepts appearing in children's library books and in basal readers and know the nuances of standard English, even before they learn to read, will have a distinct and substantial advantage over those without this school-relevant language background.

Educationally advantaged preschoolers learn much of the language useful for school success through frequent, informal verbal interactions with family members and peers, dialogues which Strodbeck (1964) has referred to as the "hidden curriculum" of the home. For those whose familial and peer interactive systems do not provide the "language of school instruction," some form of direct training must be alternatively given, with the school becoming the major provider. Early childhood intervention advocates (Bereiter & Engelmann, 1966; Durkin, 1970; Weisberg, 1983) have all contended that such language training should at least begin in the preschool and that it be frequent, intensive, and teach those language concepts and communication skills

associated with school success. Indeed, this is what the Distar Language program attempts to do and we use it partly because it should help the children understand the content in Distar Reading.

Space constraints do not permit a sufficient description of Distar Language, although for present purposes we wish to focus on not what is taught but how the language concepts and necessary information are conveyed. The primary means of communicating with Distar and other language programs, including incidental learning situations, is through verbal means. The teacher(s) or parent presents examples of concepts, sometimes using pictures or concrete objects, and then tries to describe, explain, or otherwise tell what the objects are, what they represent, and how they relate to other things. If objects are not shown, the information and language relationships are still imparted by the spoken word. For example, an adult might say that a forest is a place with lots of trees or that glass melts when it gets very hot. Much of early vocabulary and related language training is normally derived through listening to what others have to say and such vocabulary attainment is often referred to as a listening vocabulary. (Listening is used merely to focus attention on the source of language concepts and information, not on who is the passive or active agent during this process; during this process, the child unquestionably initiates conversation and freely uses language to describe objects and events and to seek information). It stands to reason that a sufficiently large

vocabulary and fund of world knowledge developed by listening to and interacting with educated people will place the child in a favorable position when it comes time to use this knowledge base to understand reading material.

A far more expansive and efficient means to enhance the child's vocabulary and worldly knowledge is to learn by reading books of all kinds -- science, geography, history, math, social science, and so forth. However, this ever-expanding reading vocabulary must await the establishment of strong reading skills. In the meantime, the young nonreader is dependent upon vocabulary learning from what others tell him and, if these informational sources are inadequate, so will be one's listening vocabulary.

The disadvantaged school-aged child is thus caught in an educational dilemma. Not able to understand what is read because of a poorly developed listening vocabulary and not able to expand one's reading vocabulary because of poor or undeveloped reading skills, the child is instructionally at a standstill. The obvious solution is to speed up the process of teaching the missing listening vocabulary and to start reading training as early as possible so that the young learner can increase his reading vocabulary through books and such.

In the Distar Language II program, there are several critical thinking and problem-solving skills which are taught primarily through verbal presentation procedures. Although quite workable most of the time, this method can sometimes prove to be an arduous and difficult one, especially when the learner needs to keep

track of, and organize, so many procedural steps and details "in his head." For example, one Language II track is the teaching of Analogies. There are several ways to categorize objects and to do analogies: on the basis of the class the objects are in, e.g., plants, tools, vehicles, furniture, etc.; their parts; what materials they are made of; where they are normally used or located; special uses or actions; and a wide variety of physical attributes pertaining to size, shape, weight, texture, color, and so forth. Telling a preschooler to think of two objects, e.g., a flower and a chair, and to state an analogy using the class each object belongs to, as in "A flower is to plants as a chair is to furniture," can present quite a formidable task. The task is made less cumbersome and the memory load lessened if external referents, such as pictures, are employed. However, not all analogy categories can be easily and unambiguously represented through illustrations; hard to portray are the materials objects are made of, the class they are in, and some of their physical attributes.

We believe that task difficulty is greatly diminished by having the learner read the analogy. By presenting it in printed form, the learner can always refer to the task objective and select and edit his answers in accordance with it. As with the use of pictures, presenting the task in printed form serves to reduce the memory load as compared to a strictly verbal presentation procedure. Figure 8 shows two analogy tasks which our children do by reading and writing.

Insert Figure 8 about here

---

sharome What class these objects are in.

(a)

A flower is to as A chair is to

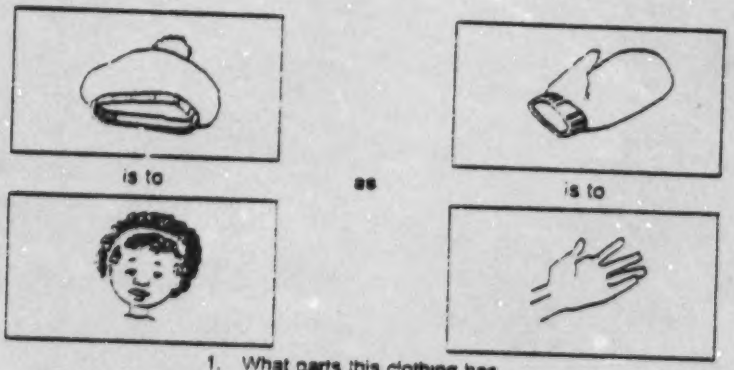
plants furniture

furniture food plants

Point to the words and say the analogy.

SIDE 2 ANALOGIES

(b)



is to as is to

1. What parts this clothing has.
2. Where you wear this clothing.
3. What this clothing is made of

Where you wear this clothing

Point to the pictures and say the analogy. Draw a line from the right rule for this analogy.

Figure 8. Sample Language II Take-Home tasks (lesson 156) involving written and picture analogies. Children work the analogy given the written analogy rule in the top task (a) and deduce the written analogy rule given the picture analogy in the bottom task (b).

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In the top analogy, the learner first reads the rule for the analogy, in this case, what class the objects are in, and then completes it according to the defining characteristics pertaining to class. The bottom analogy task reverses the order of steps to the solution. The learner looks at the pictures and figures out the analogy by selecting the appropriate rule. Analogies based on other categories, namely parts, location, materials, uses, and physical characteristics could be similarly designed. To make sure the reader is guided by the appropriate analogy category, the choice of answers could be so structured to fit that stipulation.

The task in Figure 8 was selected from a take-home near the completion of the Language II program, lesson 156 to be exact. It is not until three-quarters of the way through the language program that reading begins to play a major role in teaching thinking skills. We think the authors would have used reading as a way to impart language concepts and thinking tasks earlier and to a greater extent but refrained from doing so because of the uncertainty of the learner's reading ability. Since our preschoolers with about 1½ years of reading training are so facile at reading, we have taken advantage of this fact and have designed many formats to expand their knowledge of certain language concepts. Formats dealing with synonyms, opposites, and the physical attributes of objects are some in which the children practice by reading.

We have already shown the kinds of content our preschoolers

can read for entertainment, following instructions, and doing problem-solving tasks. As they become more proficient, an increasing amount of reading is done to gather information about the world, particularly about things they are not likely to have contact with. As a case in point, Figure 9 presents a sample paragraph about the melting properties of glass, taken from a take-home near the end of Reading II.

Insert Figure 9 about here

Given that the child can decode the words and that the vocabulary and syntax are understandable, there is almost no end to the kind of information and concepts that can be presented to the children who were otherwise not provided with a varied and sophisticated listening vocabulary.

Did you know that glass melts? If you take a bottle and make it very hot, you can melt it. First, the bottle will become soft. When the bottle gets hotter and hotter, the glass will start to turn red. When the glass is very, very hot, it will flow like water. Watch out when glass melts. It is very, very hot.

Circle the answer.

1. The best title for this story is _____.

   Glass Melts Glass Becomes Soft A Bottle

Fill in the blanks.

2. If you make a bottle very hot, what happens first?

   It will become _____.

3. What color will the bottle become? _____

4. Then the glass will flow like _____.

5. Would you touch glass when it was melting? _____

Make a line under the answer.

6. Does glass melt? Yes No

Figure 9. Sample Reading II Take-Home task from lesson 151 involving written instruction and comprehension questions about common information.

Criterion-Referenced Assessment

We have used two fundamentally different approaches to evaluate the reading progress of the children in our program, the first of which is criterion-referenced assessment. In this approach, each child's progress is compared to certain performance standards, based on components of the instructional program and expressed in terms of program objectives or skills taught.

Results from criterion-referenced tests alert the teacher to the strengths and weaknesses of each child, providing performance-based decisions about whether to advance to the next skill level or to give special practice and remediation, and whether to make changes in grouping the children. When problems appear with several children on test items derived from a particular lesson format, it could indicate that the format was poorly designed. If several children fail items based on formats that have been successfully taught by others, it could suggest that the teacher requires supervisory support in one or more presentation procedures.

A series of criterion-referenced tests, called Continuous Progress Tests (CPT), have been developed specifically for all content areas of the Distar program (Becker, Carnine, & Davis, 1978). Some of the major tasks taught and evaluated during the first year of Distar Reading are sound identification, decoding words, reading sentences, and answering simple comprehension questions.

Sound Identification

From 2 to 3 new sounds taught during a previous lesson decade, mixed with 2 to 7 old or review sounds, are regularly evaluated with the CPT. (The sequence of sounds, as well as the lesson in

which each sound was introduced, has been previously presented in Figure 2.) For each sound probed, the examiner points to the sound and says, "get ready to tell me the sound... what is this?" Figure 10 shows the frequency of new and old sounds in each testing period, together with the almost-perfect performance by the DI children on identifying these sounds. Although group functions are

Insert Figure 10 about here

presented (N's range from 13 to 17 children), the trend is characteristic of the performance of individual children.

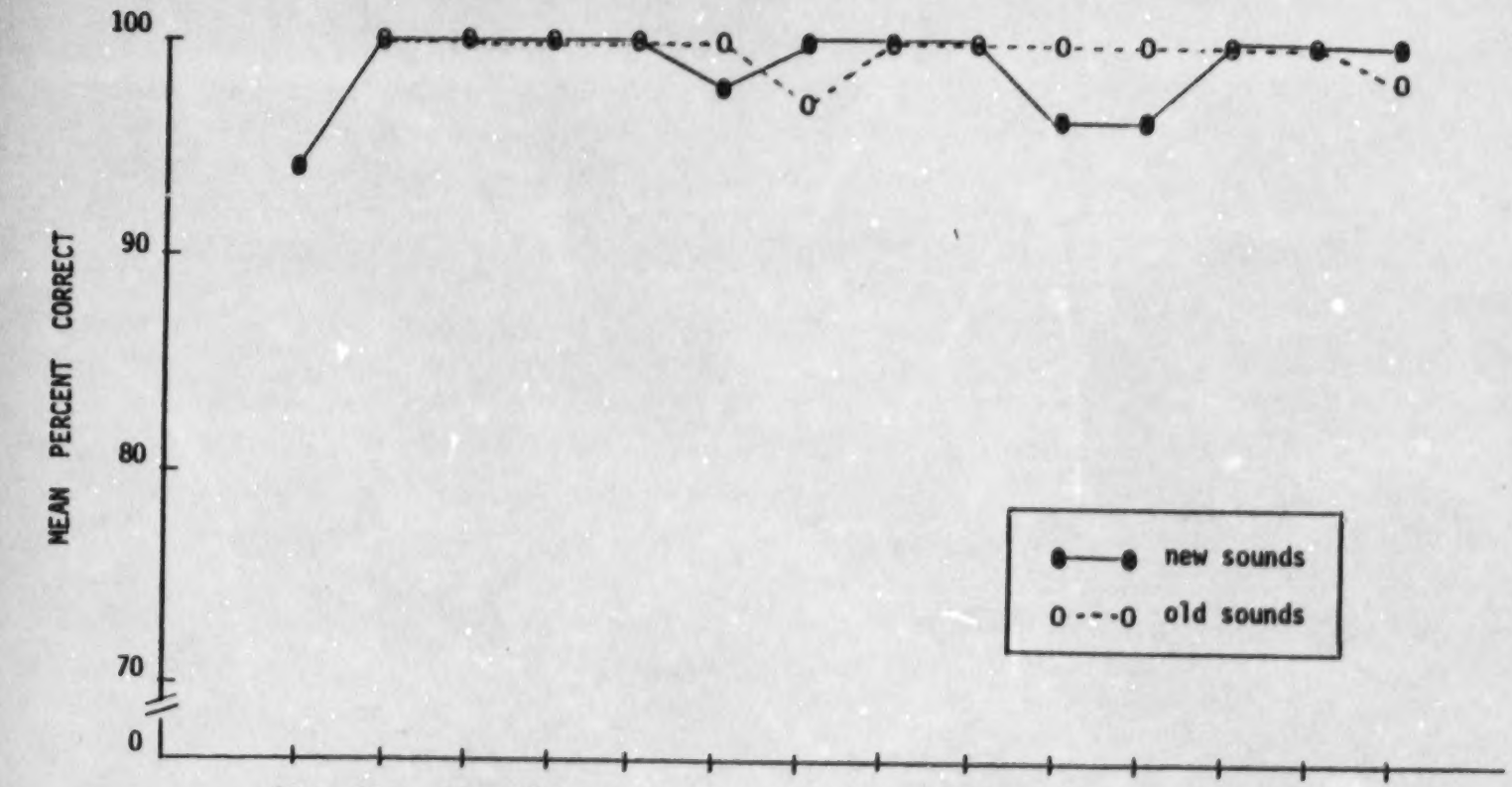
Word Decoding

The sample of words to be decoded in isolation consisted of from 2 to 9 familiar, previously trained words, as well as 2 to 3 untrained words. The latter were composed of previously taught sounds, thus requiring the children to apply a general-case decoding strategy. As Figure 11 shows, the decoding of the trained and untrained words was consistently high (an average of 90 percent) and, although performance on the trained words was better than on the untrained, the children nevertheless did reasonably well on unfamiliar, generalizable words, with performance between 81 percent and 100 percent.

Insert Figure 11 about here

Sentence Reading

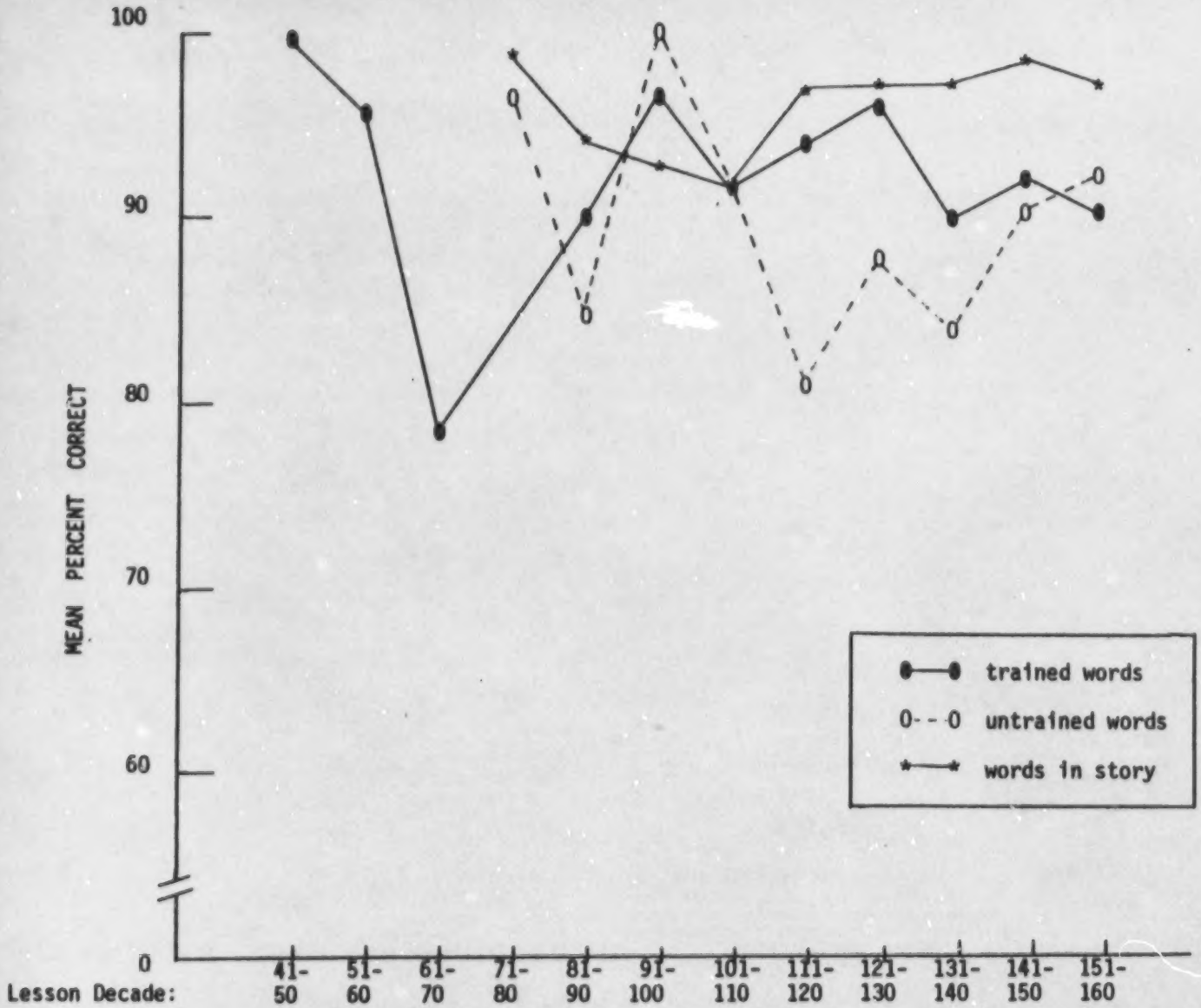
The ability to decode words orally was also assessed in the context of a sentence or a short story. The number of words in sentences/stories varied from 3 to 12 for the first four evaluation sessions and from 12 to 24 for the remaining sessions. Strong mastery of decoding words in context was revealed, as shown in Figure 11;



Lesson Decade:	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140	141-150	151-160
Number of New Sounds:	3	3	3	3	2	3	2	2	2	2	2	2	2	2
Number of Old Sounds:	0	2	2	3	3	2	6	5	4	4	7	5	4	5

Figure 10. Group performance for sound identification tasks on continuous progress tests for Reading I (N's vary from 16 to 20 children per lesson decade).

37-A



37-B

Figure 11. Group performance for reading trained and untrained words presented in isolation, and for reading trained words presented in a story, on continuous progress tests for Reading I (N's vary from 13 to 20 children per lesson decade).

that such performance was generally better than decoding words in isolation supports a common finding (Carnine & Silbert, 1979).

Comprehension

Starting with the CPT session corresponding to lesson decade 121-130 in Reading I, the children read a three-sentence story and orally answer simple, quite-literal questions about each sentence. Performance on this task was perfect for all children. For the decade 131-140, a three-sentence story is given containing two written questions and the right answer, to be circled from among three choices. Task performance similarly revealed a high level of mastery (95 percent correct). Picture comprehension tasks are used for the decade 121-130, wherein a line is to be drawn through the words in a box that does not tell about a target picture, and for the decade 141-150, wherein a line is to be drawn from one of each of four sentences to an appropriate picture. On both tasks, performance was better than 93 percent.

Norm-Referenced Evaluation

The second evaluative approach is norm-referenced testing, in which age or grade level norms, established from standardized achievement testing, form the basis for comparing our children's performance each year to the normative data (Horst, Tallmadge, & Wood, 1975). It is also possible to make between-group (or treatment) comparisons whereby Distar-trained children are contrasted with those from other preschool programs on various evaluative measures that supposedly reflect common instructional objectives. Three norm-referenced tests were given: the Wide Range Achievement Test (WRAT), the Gates-MacGinitie Reading Test (given in 1977 only),

and the Metropolitan Achievement Test (MAT).

Wide Range Achievement Test (WRAT)

The WRAT (Jastak & Jastak, 1978) is a standardized, norm-referenced instrument with very high split-half reliability (.98) and reasonable concurrent validity (The median concurrent validity coefficient with various subtests of other standardized achievement tests, e.g., SAT and MAT, is about .70 for WRAT Reading and .65 for WRAT Arithmetic). It has been employed in a number of large-scale and experimental preschool intervention projects (Anderson, 1982; Engelmann, 1971; Miller & Dyer, 1975; Weisberg, 1973) and has proven to be sensitive to different instructional approaches.

The same set of items for a particular WRAT subtest are given to all children belonging to a wide age range; in fact, from age 5 years to 12 years for one level and from 12 to 65 years of age for another level. Commonality in test content is an appealing test feature since the performance of different-aged children can be referenced with respect to the common content. One reason why we have avoided reading readiness tests is that the content at two age levels, for instance, at the preprimer and primary levels, is not the same and is, therefore, likely to measure different skills. Another feature of the WRAT is that it allows the measurement of oral reading, a skill that is compatible with our program objectives but one which reading readiness tests do not directly measure. Proficiency in oral reading can be assessed as early as four years of age with grade ratings possible at this age, but normative data in the form of standard scores and percentiles are not available until the child

is five. We will take a closer look at exactly what kind of reading skills the WRAT measures and how well children from different programs do on each skill later, but first, let's turn our attention to the normative performance of our children starting in 1977, when we conducted our first evaluation, up until the most recent evaluation year, 1982 (see Figure 12).

Insert Figure 12 about here

The data are plotted in percentile scores which conform to equal interval differences of a one-fourth standard deviation unit on the normal curve. This means that a percentile change from the 7th to the 11th percentile spans a standard deviation unit just as large as a change from the 40th to 50th percentile or from the 98th to 99th percentile. Although percentiles are presented, the averaging procedure was actually based on raw score conversion to standard scores; once the mean standard scores and the mean age of the group was found, the corresponding percentiles from the 1978 WRAT Manual were derived and plotted. The point made here is that at no time were the percentile scores based on a procedure that averaged percentiles. Mean standard scores could have just as legitimately been presented, but we favored the educationally more familiar percentile score.

Two groupings of children are shown: those about to enter first grade in the coming Fall, labeled here as 1st-starting, and those who were going to be between 5 and 5½ years old by the coming Fall, labeled here as Kindergarten or K-age. First-starting children typically had the benefit of two program years whereas K-age children had one year of the program.

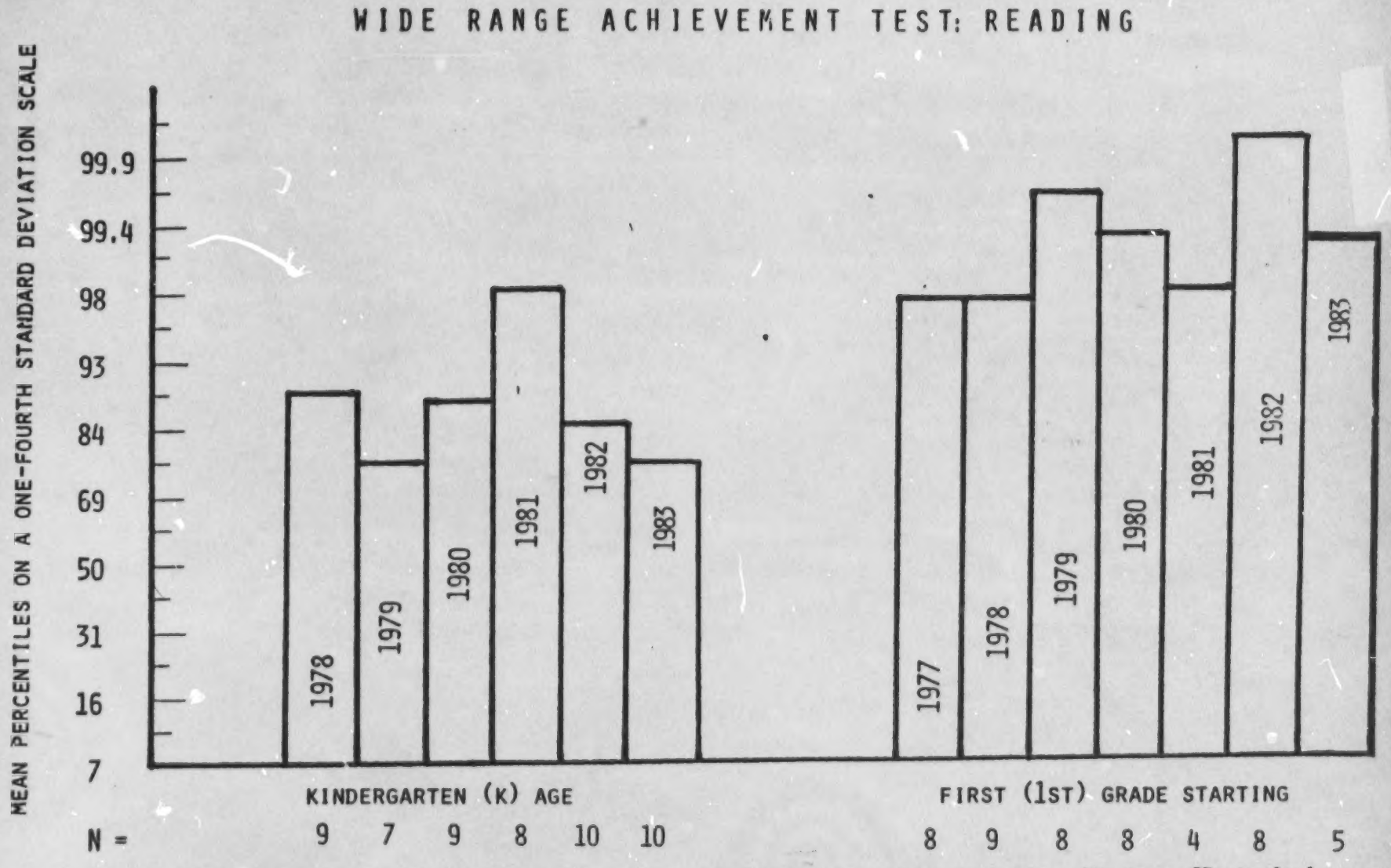


Figure 12. Within program changes in WRAT Reading. Data are plotted in equal percentile units on a .25 standard deviation scale.

Across program years, every 1st-starting and K-age group scored substantially higher than the 50th percentile on WRAT Reading. The 1st-starting children are consistently above the 95th percentile, and in some program years, they are knocking the ceiling off the WRAT norms for Reading! The K-age children are also advanced, scoring from the 77th to the 98th percentile over program years.

The reason why DI-trained children do well on WRAT Reading can be understood by considering the subskills tested and how well children from different programs do on them. In 1980, the WRAT was part of a test battery (including the Slosson IQ test and the Metropolitan Acheievement Test) administered to disadvantaged children from a local Head Start program and from a Child Development preschool, both run along the lines of a Structured-Cognitive program (Bissell, 1973). Children from both groups were from the same SES background and residential area as the ECDCC program (see Sims & Weisberg, 1982). Like the ECDCC, the Child Development preschool was a campus-based facility under state contract to furnish services for low-income preschoolers. It was housed in the Home Economics Division of the University of Alabama and had been in operation for ten years. In fact, the local welfare agency assigned children either to this program or to ours on a random, first-come, first-served, basis.

In addition, we were able to track down a comparison group which had never attended a preschool or a kindergarten program but were from the same neighborhood and from the same SES composition as the preschool groups, although they were several months older at the time of testing. As it turned out, there were not any statistical differences among the Head Start, Child Developmen , and No-Preschool Groups on total raw scores in WRAT Reading. The data in these groups were thus combined and called, for purposes of identification,

the Non-DI (Non-Direct Instruction) Group. Table 2 shows their mean performance in contrast to our DI group at both the 1st-starting and K-age level on each Reading subskill.

Insert Table 2 about here

The four subtest skills can be divided into two broad categories. There are those which we call rudimentary public school skills because most children know or are able to do them by the time they enter first grade or, most certainly, will be taught them within the first several weeks of public school. These include the first three skills in Table 2: labeling two letters in one's name, matching alphabet letters to a sample letter, and naming letters of the alphabet. Indeed, some might claim that these tasks are not only rudimentary but are irrelevant for the teaching of effective word-attack strategies. The second category of subtest skills we call substantive public school skills, one of which consists of reading or decoding words, a relatively more difficult skill that only a small percentage of children can do before first grade (Durkin, 1966; Morrison, Harris & Auerbach, 1971), and one that is not normally mastered by many until well into first grade or, unfortunately, is never learned by an alarming number of children throughout their school years (Harman, 1970).

Clearly, it is not the rudimentary subskill category that distinguishes DI from non-DI children, but rather the substantive subskill of decoding words. This contention is supported by parametric and nonparametric statistics, wherein no significant between-program differences (DI vs. non-DI) were found for the first three subskills, either for the K-age or the 1st-starting

TABLE 2

MEAN WRAT READING SUBTEST RAW SCORES FOR DIRECT (DI) AND NON-DIRECT (NON-DI) INSTRUCTION PROGRAMS

SUBTEST	MAXIMUM SCORE	K-AGE		1ST-STARTING AGE	
		DI	NON-DI	DI	NON-DI
LABELING TWO LETTERS IN NAME	(2)	1.5	1.3	1.6	1.8
LETTER MATCHING	(10)	9.9	9.7	10.0	9.9
LETTER NAMING	(13)	6.2	5.2	10.9	10.0
READING	(75)	9.1	.2	28.4	2.2

age groupings, whereas the effects for Reading were significant ($p<.0001$) for each of the two age groupings. A significant between-age group (K-age vs. 1st-starting) effect was not found for the first two subskills, but the age effects were reliable for Letter Naming ($p<.0001$) and for Reading ($p<.0001$) (Letter Naming is not taught until the second year of Distar; thus, the K-age children and those in the 1st-starting group with only one program year did not know many alphabet letters). The program × age grouping interaction was significant only for the Reading subtest ($p<.0001$).

The same pattern of WRAT subskill performance for the ECDCC groups in 1980 has been obtained for every evaluation year. Especially procative was the decoding performance of the 1st-starting children with two program years. Of the first 50 WRAT words, a total of 21 words should have been familiar since they were explicitly taught in Distar Reading (12 words from Level I and 9 words from Level II). Nevertheless, the preschoolers were able to decode a large number of never-presented words, such as size, weather, stalk, cliff, struck, glutton, and threshold. The two-year DI-trained children had little trouble with other word lists: of the 220 Dolch sight words (Dolch, 1936), extending from preprimer to third grade, an average of 95 percent were correctly read, and of the 37 words used by Durkin (1966) to identify early readers, 99 percent were correctly read. These findings suggest that the excellent decoding skills imparted to public school children by the Distar Reading program (Becker, 1977; Becker & Gersten, 1982) can be similarly generated with preschoolers.

The rudimentary-substantive skill discrepancy is also true of another WRAT test, namely Spelling. Three performances are measured in Spelling: printing one's first name, copying marks resembling parts of letters and other academic symbols, and spelling words from dictation. Of the three, spelling words is obviously the more substantive and desirable public school skill, and it is one that distinguished DI from Non-DI trained Groups (see Table 2). That the DI Groups are better at copying marks is

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Insert Table 3 about here

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not surprising. The marks largely resemble parts or the entire components of alphabet letters, numerals, mathematical symbols, and other notations. The pretest data of both DI and Non-DI Groups indicate an initial inability in making marks but, the DI children, given daily handwriting training in all content areas, become increasingly adept at writing and attending to the necessary details. (Sims, Weisberg, & Sulentic, 1983 have also discovered that DI children draw more detailed pictures of people which has also been attributed to instructional and practice variables.)

Of the 1st-starting groups, an average of 9.2 words are correctly spelled by the DI Group compared to 1.5 by the Non-DI Group. Of the K-age groups, the DI children have not yet become proficient at spelling words from dictation, averaging only 2.7 correct words compared to 0 words spelled by the Non-DI Group.

The Distar program teaches the children to spell phonetically. Accordingly, the words will be spelled as they are pronounced, but because of grapheme-phoneme irregularities in the English language, many irregular words will be spelled incorrectly on the WRAT.

TABLE 3

MEAN WRAT SPELLING SUBTEST RAW SCORES FOR DIRECT (DI) AND NON-DIRECT (NON-DI) INSTRUCTION PROGRAMS

SUBTEST	MAXIMUM SCORE	K-AGE		1ST-STARTING AGE	
		DI	NON-DI	DI	NON-DI
COPYING SHAPES	(18)	14.1	9.5	17.1	12.8
WRITING NAME	(2)	1.9	1.5	2.0	1.8
SPELLING DICTATED WORDS	(45)	2.7	0.0	9.2	1.5

Still, the children are producing a fairly close correspondence between what sounds are heard in a word and how these sounds are written phonetically. As the spelling performance of one of our children reveals (see Figure 13), the child is spelling according to a definite and reasonable pattern: kocc for cook, gron for grown, edvis for advice, reazmabl for reasonable, amaghery for imaginary, acyoupie for occupy, and so forth.

Insert Figure 13 about here

We have replicated the WRAT findings in Reading with a much larger preschool N. We have found, as the Head Start Planned Variation Project has shown (Weisberg, 1973), that disadvantaged children beginning a preschool program may have little in the way of knowing rudimentary academic skills, but, after one or two years in a preschool intervention project, they can make great strides in learning these skills. But one can ask if such mastery will put them in a highly favorable position when they enter first grade. More often than not, their middle-class peers will also have mastered the rudimentary skills, regardless of whether they attended preschool. Futhermore, if a beginning first grader is somewhat ahead of another because he attended preschool and was taught rudimentary skills, such as recognizing or saying all of the alphabet or printing one's first name, the less-advanced child can quickly reach these performance standards set by the limited skills of alphabet letter acquisition or letter printing.

Consider again the performance of the Non-DI Groups. It might be supposed that these children, by virtue of being competent only in the rudimentary skills, would place in a relatively low

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JASTAK ASSESSMENT SYSTEMS

1978 EDITION **WRAT**

WIDE RANGE ACHIEVEMENT TEST

Joseph F. Jastak, Sidney W. Bijou, Sarah Jastak

Name _____ Sex M F

Date 6-6-80 Birth Date [redacted] Age [redacted]

School ECDCC Grade PP K

Referred by _____ Examiner _____

Test Results:	Raw Score	Grade Rating	Standard Score	Percentile
Reading	62	4.9	7155	>99.98
Spelling	35	3.7	144	99.6
Arithmetic	28	3.5	135	99

Page 1

Spelling, Level I & Level II

–	ı	/	\	O	X	⌋	V	⌝	+	∧	⌜	Δ	⊐	⊔	▽	⊏	⊓
–	ı	/	\	O	X	⌋	V	⌝	+	∧	⌜	Δ	⊐	⊔	▽	⊏	⊓

Name delshaun

1.	GO	go	16.	order	order	31.	arrangery
2.	cat	cat	17.	watch	watch	32.	acyaupie
3.	in	in	18.	iriter	enter	33.	carker
4.	boy	boy	19.	gron	grown		
5.	and	and	20.	nacher	nature		
6.	will	will	21.	exsplan	explain		
7.	make	make	22.	ech	edge		
8.	him	him	23.	Kitchen	kitchen		
9.	say	say	24.	surpris	surprise		
10.	cut	cut	25.	reazer	result		
11.	Kooc	cook	26.	eduis	advice		
12.	lint	light	27.	purches	purchase		
13.	must	must	28.	brealis	brief		
14.	drees	dress	29.	sesses	success		
15.	reach	reach	30.	reazmabl	reasonable		

Level I, Raw Scores (RS) and Grade Ratings (GR) _____ Level II, Raw Scores (RS) and Grade Ratings (GR) _____

Figure 13. Wrat spelling performance of a child from the ECDCC program. Correct spelling of words are typed either to the right or separately under a group of words.

ranking with respect to their same-aged peers who comprised the WRAT standardization sample and for whom the norms were based. Such is not the case. The average non-DI child, between 6 and 6½ years about to enter first grade unable to read and who obtains the same scoring profile as the average 1st-starting disadvantaged child in the Non-DI Group on the WRAT subtests in Table 2 (a raw score total of 23.9), would rank at the 47th percentile. That same child, who obtains the scoring profile of the average 1st-starting Non-DI child on the Spelling portion (a raw score total of 16, see Table 3), would rank at the 30th percentile. The 30th percentile may not seem high, but it is more than ¼ to ½ standard deviation units higher than the percentile where most disadvantaged children fall on achievement tests (U.S. Office of Education, 1976).

That a preschool intervention program can be judged as a relatively successful project if normative data from the WRAT are used, even though its graduates are barely able to read, is possible because the skills tapped by the WRAT to gauge average first grade-entering performance are mediocre ones. Stated differently, entering first graders are not expected to be proficient at reading (nor at spelling or doing written arithmetic problems). The literature on entry skills in early reading provides strong empirical support. Durkin (1966) found that less than 1 percent of 5,103 beginning first graders in California could read a minimum of 18 words from her 37-item list which consisted of words common to the preprimers of three basal readers. Evaluating almost 4,500 New York City children with the same list, 4 percent reached her word recognition criterion. Her select group of early readers were, furthermore, distinguished as having relatively

higher IQ's (a median of 121 for the California group and 133 for the New York City group). Evaluating the entering reading performance of over 1,000 disadvantaged urban Black children in the New York City public schools, Morrison et al. (1971) reported that only 4 percent could identify one or more words on the Detroit Recognition Test. Finally, in the nationwide Head Start Planned Variation (HSPV) Project that included eight different preschool models, the WRAT Reading subtest was administered as part of a large battery, but was found (along with the WRAT Spelling and written Arithmetic) to be "clearly too difficult for Head Start children" (Weisberg, 1973, p. 33).

As an aside, teaching the rudimentary skills contained in the WRAT cannot be considered a trivial accomplishment since many preschool programs fail to sufficiently establish even these skills. As such, the Head Start and Child Development programs have done a credible job on this score: when compared to the over 2,000 one-year preschoolers in the HSPV Project, these two non-DI programs came out somewhat higher than the overall HSPV mean on Letter Matching and Letter Naming.

Primary Grade Achievement Tests

As an instrument to evaluate various dimensions of reading achievement, the WRAT is quite restricted, limited largely to the decoding of words. Because the Distar-trained children were being taught much more than word-attack skills, we needed a norm-referenced test designed to measure more substantive content areas, such as being able to discriminate and comprehend the meaning of printed words, sentences, and stories. Reading readiness tests were again of no help since they assess none of these skills (Nurss,

1979). We, therefore, chose first grade or primary level achievement tests. For the first evaluation year in 1977, the Gates-MacGinitie Test (Gates & MacGinitie, 1965) was used, but since then the evaluation instrument has been the Metropolitan Achievement Test (MAT) (Durost, Bixler, Wrightstone, Prescott & Balow, 1971). The MAT was the school achievement instrument of choice in the Follow Trough Project (Abt Associates, 1977). As with any widely used norm-referenced test, the items in the MAT Reading are based on a sampling of curricular material from leading children's readers (usually basal readers), syllabuses, and state guidelines. To the degree that this sampling realistically represents the content commonly taught in first grade, the MAT's or any achievement test's content validity is ensured. The MAT's reliability is high (.83 to .96 based on odd-even correlations and .86 to .89 based on its alternate forms).

The Reading section contains three subtests, sample content for each of which are presented in Figure 14 for Word Knowledge, in Figure 15 for Word Analysis, and in Figures 16 and 17 for Reading Sentences and Stories. The scores for the subtests of Word Knowledge and Reading Sentences and Stories can be combined to give a Total Reading composite score.

Insert Figures 14, 15, 16, and 17 about here

The median grade scores by subtest (excluding Total Reading) for the 1st-starting children for each program year are presented in Figure 18. (As with the WRAT, averaging was done with standard

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Insert Figure 18 about here

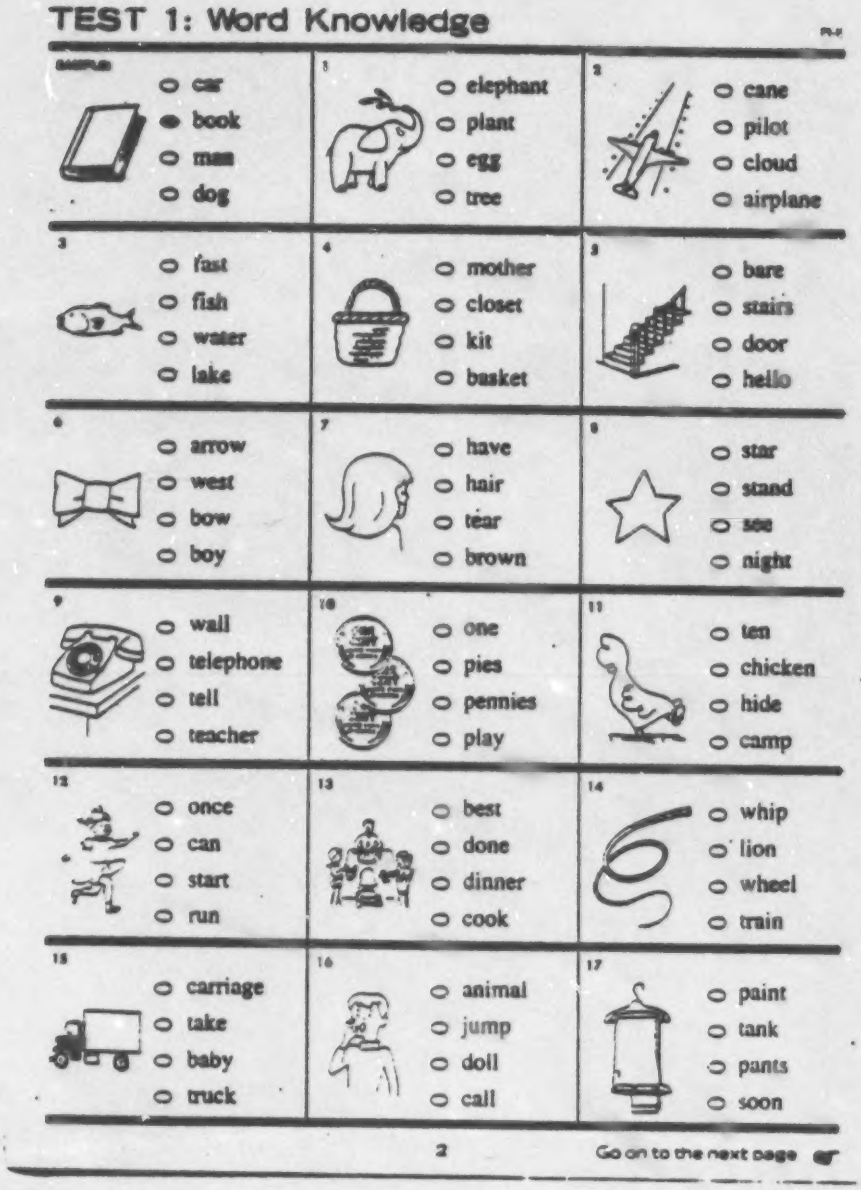
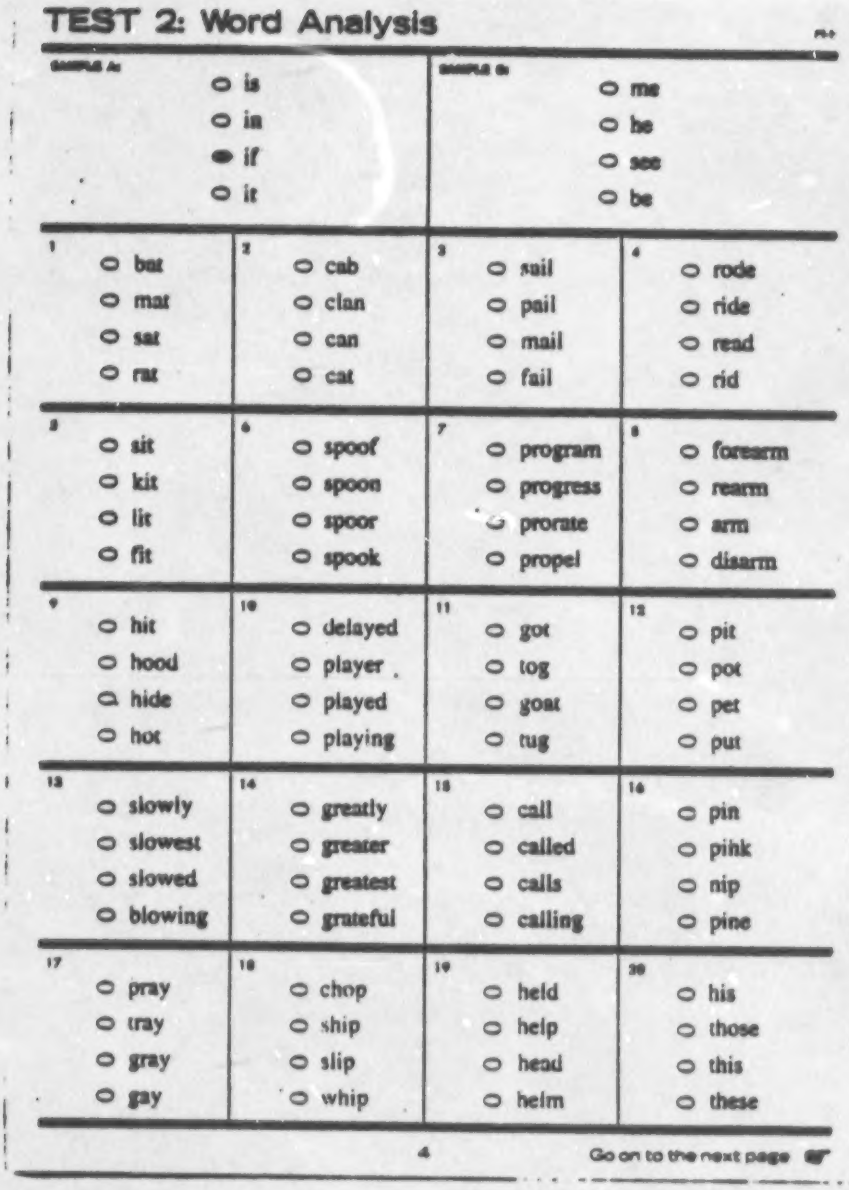


Figure 14. Sample items from the Word Knowledge subtest of the 1971 MAT.



TEST 2: Word Analysis

SAMPLE A: ○ is ○ in ● if ○ it		SAMPLE B: ○ me ○ he ○ see ○ be	
1 ○ bat ○ mat ○ sat ○ rat	2 ○ cab ○ clan ○ can ○ cat	3 ○ sail ○ pail ○ mail ○ fail	4 ○ rode ○ ride ○ read ○ rid
5 ○ sit ○ kit ○ lit ○ fit	6 ○ spoof ○ spoon ○ spoor ○ spook	7 ○ program ○ progress ○ prorate ○ propel	8 ○ forearm ○ rearm ○ arm ○ disarm
9 ○ hit ○ hood ○ hide ○ hot	10 ○ delayed ○ player ○ played ○ playing	11 ○ got ○ tog ○ goat ○ tug	12 ○ pit ○ pot ○ pet ○ put
13 ○ slowly ○ slowest ○ slowed ○ blowing	14 ○ greatly ○ greater ○ greatest ○ grateful	15 ○ call ○ called ○ calls ○ calling	16 ○ pin ○ pink ○ nip ○ pine
17 ○ pray ○ tray ○ gray ○ gay	18 ○ chop ○ ship ○ slip ○ whip	19 ○ held ○ help ○ head ○ helm	20 ○ his ○ those ○ this ○ these

4 Go on to the next page

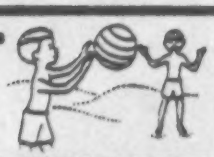
Figure 15. Sample items from the Word Analysis subtest of the 1971 MAT. Examiner says a word and children are to mark that word.

TEST 3: Reading *Part A: Sentences (continued)*

7

- The man is getting on the train.
- The train is moving fast.
- The train has a flat tire.

8



- The boy dropped the ball on the ground.
- A boy is throwing a ball to his friend.
- The boys are playing football.

9

- People come here to buy food.
- You cannot buy fruit here.
- This is the best place to buy clothes.

10

- Today Miss Dunn's class is having a party.
- The children are going outside for a game of ball.
- It's Saturday and the children are not in school.

11

- There is water coming from the hose.
- The men are going to water the grass.
- You would call these men if you had a fire.

12

- The boy watches the sun.
- The boy looks out at the starry night.
- Ted pulls down the window shade.

13

- Children may work here.
- Many toys are sold here.
- This is a good place to save money.

Figure 16. Sample sentence items from the Reading Sentences and Stories subtest of the 1971 MAT.

TEST 3: Reading *Part B: Stories (continued)*

SAMPLE Ted has a puppy.
His name is Happy.
Ted and Happy like to play.

A The pet is a —
● dog ○ boy ○ toy

B Ted and Happy like to —
○ play ○ work ○ look

"Tell me a story, Mother," said Joe.
"Tell me about *The Three Bears*.
I like that story the best."

22 The story Joe liked best was —
○ *The Three Bears*
○ Snow White
○ Baby Bee

23 Joe is a —
○ bear ○ pet ○ boy

24 Joe wanted to hear a —
○ horn ○ story ○ noise

We go to school by bus.
It is a special yellow school bus.
Today we almost missed the bus.
We had to run to catch it.

25 We ride to school on a —
○ bus ○ bicycle ○ scooter

26 What is the color of the school bus?
○ red ○ blue ○ yellow

27 Today we were —
○ sick
○ almost late
○ on vacation

28 We caught the bus by —
○ hopping ○ laughing ○ running

Mother said, "Don is seven today."
Helen put red candles on the cake.
She put seven candles here and there.
Then she put on one more candle.
The last candle was for good luck.

29 How old is Don today?
○ six ○ seven ○ five

30 The cake is for —
○ Don's birthday
○ Helen's party
○ Mother's Day

31 What color are the candles?
○ red ○ blue ○ green

32 Who put candles on the cake?
○ Mother ○ Don ○ Helen

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9 Go on to the next page ☞

Figure 17. Sample story items from the Reading Sentences and Stories subtest of the 1971 MAT.

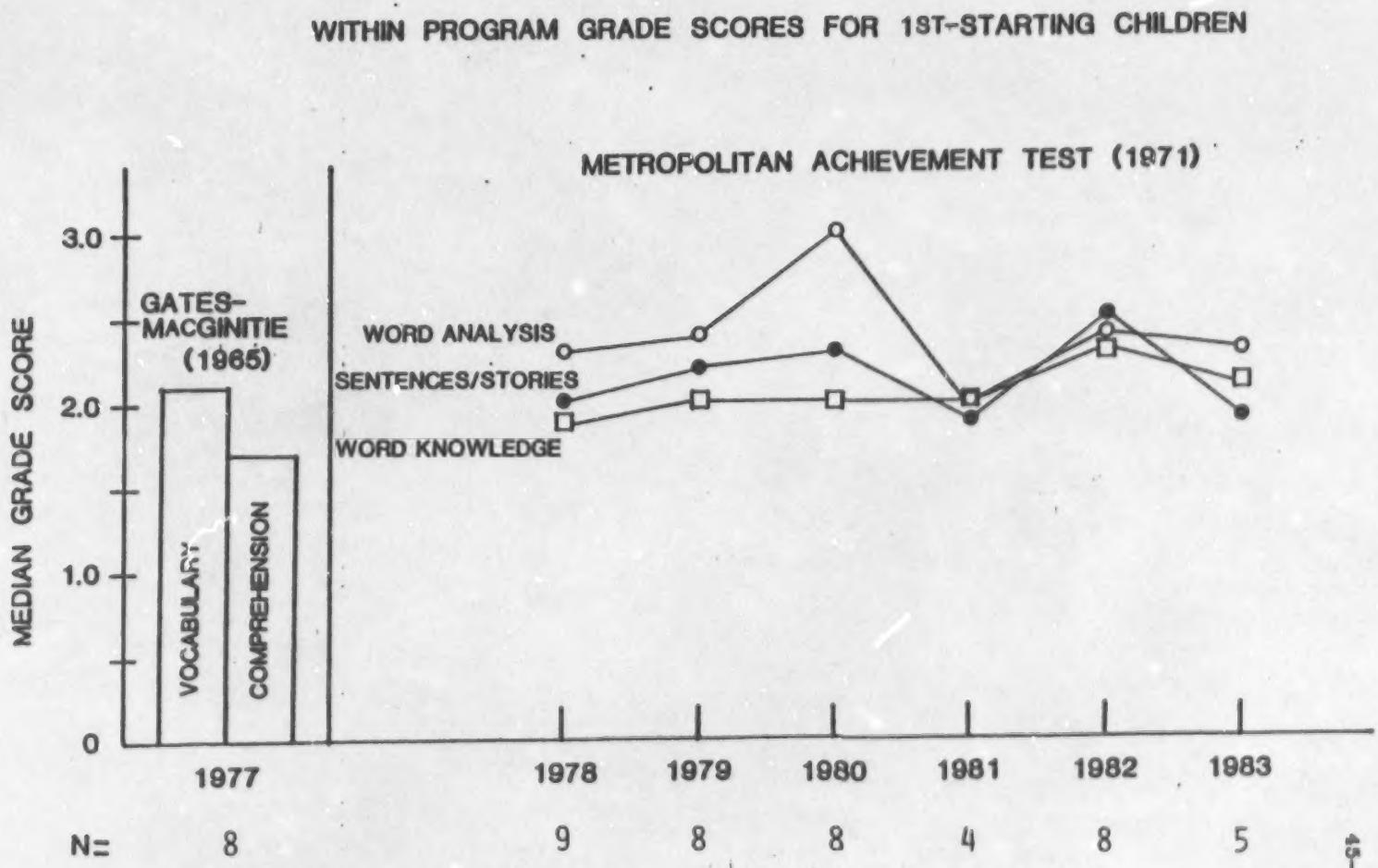

Figure 18. Within program changes in median grade scores for primary level achievement tests.

scores, never with grade scores or percentiles. Based on raw score conversions to standard scores, the median standard score for each evaluation group was calculated, from which corresponding grade scores were derived. Percentile values were available in the MAT test Manual (1971), either for an end-of-first grade norm group or for a beginning-second grade norm group).[2]

For the Gates-MacGinitie Test, the end-of-first grade score at the 50th percentile for the Vocabulary subtest is 2.2 and for Comprehension it is 1.9. For the MAT subtests, the equivalent grade score at the 50th percentile is 1.8 for Word Knowledge, 1.7 for Word Analysis, 1.7 for Reading Sentences and Stories, and 1.8 for Total Reading.

It is readily apparent from Figure 18 that for most evaluation years the plotted G.S. either approximates or is higher than end-of-first grade normative performance for the MAT.[3] Just to single out the 1980 program year (when the MAT was also given to non-DI Groups), the corresponding percentile values by subtest for the obtained median G.S. was: the 70th percentile for Word Knowledge (G.S.=2.1); for Word Analysis, the 94th percentile (G.S.=3.0); the 88th percentile for Reading Sentences and Stories (G.S.=2.4); and for Total Reading (not shown in Figure 2), the 78th percentile (G.S.=2.2).

The performance of the 1st-starting DI Groups seems remarkable in light of the fact that disadvantaged children are commonly from four to six months below grade level in reading by the end of first grade (see each of the control groups' first grade G.S.'s reported in Gray & Klaus, 1970; Miller & Dyer, 1975;

and Morrison et al., 1971). This below-grade performace occurs even when they have been part of a preschool intervention project (Ramsey, 1968). The only published study this author is aware of which reported acceleration by beginning first graders on advanced reading achievement tests measuring comprehension was Durkin's (1966) select group of high IQ preschoolers who were taught reading skills at home.

Since the MAT contains a multiple-choice format, the raw scores of all groups from the 1980 between-groups comparison were examined to see which ones exceeded chance performance. Not surprisingly, both those children at the K-age and 1st-starting levels from the non-DI Groups guessed freely and answered at chance level on each subtest. Answering according to chance is also what Kennedy et al. (1963) found when a large proportion of 300 Black first graders from five Southeastern States took a primary grade achievement test during the first few months of public school.

In contast, the raw scores of the 1980 K-age DI-trained children exceeded chance on both the four-choice, 35-item Word Knowledge subtest, averaging 14 correct items ($p<.05$) and on the four-choice, 40-item Word Analysis subtest, averaging 16 correct items ($p<.05$). (The scores for 1st-starting DI-trained children were appreciably higher, averaging 24 correct items on Word Knowledge and 34 correct items on Word Analysis). The K-age children, however, answered at chance level on the three-choice, 42-item Reading Sentences and Stories subtest, averaging only 11 correct items. (The 1st-starting children were above chance, averaging 26 correct items).

The answering profile of the 1980 K-age DI group was typical

of how K-age children from the other program years at the ECDCC did on the MAT. They are 'holding their own' both on decoding words, as reflected by the Word Analysis subtest (selecting the same word as that dictated by an examiner) and on understanding simple vocabulary items, as reflected by the Word Knowledge subtest (selecting the word that best identifies an aspect of a given picture). They have a harder time with more difficult reading comprehension items, as manifested by sections on Reading Sentences (selecting the sentence that best describes or implies the meaning of a pictured scene) and on Reading Stories (selecting the word or phrase that answers a written comprehension item based upon a short reading passage).

It cannot be said that the K-aged DI children have the full complement of decoding skills to tackle any word. Having only one program year, they have not yet learned to distinguish between long and short vowel sounds in many words by applying the silent-e rule; they are unfamiliar with the sounds made by many letter combinations (ea, ou, al); they have not been taught capital letters so words containing these letters will cause problems, particularly when they are dissimilar to their lower-case counterparts (A-a, D-d, G-g, R-r); and, since they have not been phased out of the special Distar orthography containing macrons, joined letters, and so forth, the regular orthography inherent in primary grade achievement tests is likely to be troublesome.

The K-age DI children are further limited since the first year of Distar Reading stresses reading for accuracy, rather than for sheer speed. Thus, they often do not finish all of the items

of those MAT subtests that are timed, namely Word Knowledge and Reading Sentences and Stories. The items they do attempt, however, are more often done correctly and, if one looks at the items completed on Sentences and Stories, they are correct on 42 percent of those attempted, as opposed to only 28 percent correct when scoring is based on all of the subtest items, whether attempted or not.

Not only are the K-age DI children penalized for taking their time to decode words, many of which are irregular, they will have trouble with the meaning of many MAT words. They are not likely to know the meaning of special, favorite, luck, pasture, flat, best and starry night, and they may not know what certain idioms mean, as in to catch a bus, water meets land, and so on.

Although they can cope with straightforward comprehension items, they are less able to deal with unfamiliar syntactical styles and inferential-based comprehension items that bring into play much outside information and relationships, as in, "I bring letters to your home. I wear a uniform. Who am I?"

All is not lost, however, for the K-age DI children. The 1st-starting children were in the same exact predicament as the K-age children just before they got another year of DI training. Fortunately, during that second year their promising decoding skills were enlarged to include a broader set of words and they were taught to read with increased fluency, speed, and expression, both during class and during independent reading activities. The greater stress in the second level of Distar Reading on developing comprehension skills, aided by the Distar Language II program which

features more complex syntax, semantic relationships, and an enlarged vocabulary, inevitably helped them to read for information and meaning. No doubt the phonetically based spelling component of the Reading II program, coupled with the opportunity to express their thoughts on paper, prompted some of them to compose their own stories, as illustrated by the one in Figure 19.

Insert Figure 19 about here

One- versus Two-Program Years

Of the 42 1st-entering children from the ECDCC who took the MAT, 12 and 30 respectively, completed one and two years of Distar Reading. As revealed in Table 4, length of program participation has a major effect on MAT outcomes.

Insert Table 4 about here

The standard score differences between the one-year and two-year children are significant for every subtest and for Total Reading (all p's <.001). The absolute differences in subtest grade scores, from 0.8 to 1.0 points, are what one would expect from an extra year of training in reading. Both groups are highest in the decoding-based Word Analysis subtest, again lending credence to the power of the Reading program to teach this skill.

It is not the case that those with two-program years of Distar Reading were "smarter" than those with one-program year. The two groups were neither significantly different from each other in either entry Slosson IQ's nor in entry WRAT scores. Furthermore, after each group had one program year, they were similar in WRAT achievement in Reading, Spelling, and Arithmetic and in IQ.

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Parshandatha

I wish I was a dancer or a sanger but I wish I was a real dancer so I can have a pretty red discoe dress on and I can dans with sombody that is going to be six just like I am going to be. and it mabe is going to be a boy named Jason, but I do not know if it is going to be him. and kaTHRan is going sāy who. Jāson, mabe Jason. and I am going to wear glass slippers and me and [redacted] Jason is going to dans very very sharp. the end

Figure 19. Original story written by a 5 year, 10 month girl attending the ECDCC for almost two years (Jason is a classmate, and Kathryn is her teacher).

Table 4

Mean MAT Subtest Scores of First-Starting Children with One versus Two Years of Distar Reading

MAT Subtest	Type of Measure[a]	No. of Program Years: One (N=12)	No. of Program Years: Two (N=30)
Word Knowledge	$\bar{X}$ S.S.	33.6	49.4
	$\bar{X}$ G.S.	1.5	2.3
	$\bar{X}$ %-ile	28th	77th
Word Analysis	$\bar{X}$ S.S.	37.2	51.2
	$\bar{X}$ G.S.	1.7	2.7
	$\bar{X}$ %-ile	46th	92nd
Reading Sentences and Stories	$\bar{X}$ S.S.	31.6	50.4
	$\bar{X}$ G.S.	1.4	2.4
	$\bar{X}$ %-ile	22nd	88th
Total Reading	$\bar{X}$ S.S.	32.1	49.1
	$\bar{X}$ G.S.	1.5	2.4
	$\bar{X}$ %-ile	23rd	88th

[a] S.S. = Standard Score; G.S. = Grade Equivalent Score; Percentiles (%-ile) are based on end-of-first grade performance.

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Footnotes

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[2]Addressing the problem of test ceilings and floor effects, Horst et al. (1975) advise that the selection of the appropriate test level be based "on the achievement levels of the pupils, not on the basis of their grade in school" (p. 15). By giving our pre-first graders a primary level achievement test which is commensurate with their functional reading skills, we have followed this practice. Horst et al. (1975) further recommend that the norm tables used to report relative status or growth (in the form of percentiles, grade scores, etc.) be taken from the current grade level that the child is in. Such a practice is especially valid if there are overlapping grade level scores that span several levels, as is the case with expanded standard scores that can be referenced to any set of normative data. Applied to our situation, expanded scores for the 1971

MAT did not extend downward to the pre-primary level. The problem of using primary grade-based percentiles for our pre-first graders is recognized; if anything, however, the normative data represent conservative estimates of the children's achievements.

[3]It is not the case that the children with two-program years of Distar Reading were "smarter" than those with one-program year. The entry Slosson IQ's and academic abilities of both groups were not statistically different from each other. Furthermore, after one program year both groups were similar in WRAT achievements in Reading, Spelling and Arithmetic and in IQ.